



CFO / CAFO APPLICATION PACKET

General Information

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

(800) 451-6027 extension 2-4473

INSTRUCTIONS:

1. Complete all general application information solicited below.

2. Provide the required signature(s) as directed.

3. Select the application type.

This form is required and supersedes all previous versions. No substitutes, altered or previously supplied forms are permissible.

6/15/15
6868
Permit App
Include 10 large format drawings that were scanned separately.

I. GENERAL APPLICATION INFORMATION

A. OPERATION INFORMATION

Operation Name:	County Line Dairy	Farm ID Number:	
Operation Address:	2625 E 1200 N		
Operation City:	Lewisville	Operation ZIP Code:	47532
Operation Telephone:	(765) 987-1909		
Operation County:	Rush		
Nearest Crossroads to Operation:	1200 N and 200 E		

B. APPLICANT (Name which will be Listed on Agency Decision)

The Applicant is the Owner/Operator (as defined under 327 IAC 19-2-32) who wants to construct or expand a confined feeding operation. An Applicant may be an individual, a partnership, a copartnership, a firm, a company or any other entity listed under IC 13-11-2-158(b). There may be more than one entity that constitutes an Owner/Operator. Each entity that meets the definition of Owner/Operator for the CFO must submit the requested information below.

Name:	Milco Dairy Farm, LLC		
Mailing Address:	9305 S CR 275 E		
City:	Lewisville		
State:	IN	ZIP Code:	47352
Telephone (Home):			
Telephone (Business):	(765) 987-1909		
Telephone (Cell):	(765) 524-0664		
Facsimile:		E-mail Address:	milcomilco@hotmail.com

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OFFICE OF LAND QUALITY

C. PROPERTY OWNER (At the Time of Application Submittal)☒ Same as Applicant Listed in Above

Name:

Mailing Address:

City:

State:

ZIP Code:

Telephone (Home):

Telephone (Business):

Telephone (Cell):

Facsimile:

E-mail Address:

D. OPERATION MANAGER, OPERATOR, AND/OR LESSEE (If Different than Applicant)☐ Same as Applicant Listed in Above

Name:

Nico Niessen, Operation Manager and Operator

Mailing Address:

9305 S CR 275 E

City:

Lewisville

State:

IN

ZIP Code:

47352

Telephone (Home):

Telephone (Business):

(765) 987-1909

Telephone (Cell):

(765) 524-0664

Facsimile:

E-mail Address:

milcomilco@hotmail.com

E. CURRENT OPERATION PERMIT INFORMATION**Current** Permit/Approval Type (check one):☐

CFO Approval

☐

NPDES CAFO Individual Permit

☒

None (New Facility, Expired Approval, Expired Permit)

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Farm ID (Log ID) Number

Current Approval (Animal Waste) Number

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II. SIGNATURES

I have reviewed all components and information contained within the accompanying forms and application materials. To the best of my knowledge and belief, such information is true, complete, and accurate. I am aware of the penalties for submitting false information under IC 13-30-10.1 and IC 35-44-2-1.

The agency decision based on the accompanying forms and application materials will be issued in the name of the person or entity listed as the applicant(s).

THIS SECTION MUST BE SIGNED.

Nico Niessen

Title of Operation Owner or Authorized Agent – Type or Print



Signature of Applicant or Authorized Agent

June 9 - 2015
Date Signed (month, day, year)

*Signature of Property Owner If Different than Operation Owner

Date Signed (month, day, year)

*A letter from the property owner acknowledging the submittal of a construction application on their property may substitute for signature.

III. APPLICATION TYPE

Utilizing the Application Type and Requirements Worksheet, in the list below, select the one, and only one application type which you are submitting.

CFO Approval – Construction and/or Operation (Including Renewals)

- | | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | A. Completely New Operation (Currently Undeveloped Site) |
| <input type="checkbox"/> | B. Existing Operation Without Existing CFO Approval |
| <input type="checkbox"/> | C. Existing Operation with Expired CFO Approval |
| <input type="checkbox"/> | D. Expansion of Operation with Current CFO Approval |
| <input type="checkbox"/> | E. Amendment of Existing CFO Approval – Permit Condition |
| <input type="checkbox"/> | F. Amendment of Existing CFO Approval – Increase in Animal Capacity |
| <input type="checkbox"/> | G. CFO Approval Renewal/Manure Management Plan |

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NPDES CAFO Individual Permit – Construction and Permit Coverage

- | | |
|--------------------------|---|
| <input type="checkbox"/> | H. Completely New Operation (Currently Undeveloped Site) |
| <input type="checkbox"/> | I. Existing Operation without Current CFO Approval or NPDES Permit |
| <input type="checkbox"/> | J. Existing Operation with Current CFO Approval |
| <input type="checkbox"/> | K. Current NPDES CAFO Individual Permit Holder Proposing Construction |

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NPDES CAFO Individual Permit - Permit Modification

- | | |
|--------------------------|---|
| <input type="checkbox"/> | L. Construction or Expansion of Storage or Animals – No Permit Extension |
| <input type="checkbox"/> | M. No Construction or Expansion of Storage or Animals – No Permit Extension |

NPDES CAFO Individual Permit - Renewal

- | | |
|--------------------------|---|
| <input type="checkbox"/> | N. Renewal Coverage for Operation with Current NPDES CAFO Individual Permit |
|--------------------------|---|



CFO / CAFO APPLICATION PACKET Notification Format for Agency Correspondence

Part of State Form 55051 (R / 11-13)
Approved by State Board of Accounts, 2013
Confined Feeding Operation (CFO)
National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
Confined Feeding Section
Office of Land Quality
100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS: The Indiana Department of Environmental Management (IDEM) normally notifies applicants of final decisions by mail. In 2012, Indiana Law changed to allow IDEM to use electronic mail instead of US Postal Service mail. This form allows you to specify whether you want to receive correspondence and notices related to your CFO or CAFO application by mail, or by e-mail. It also allows you to specify if you want correspondence directed to a consultant by e-mail. Please complete the information below to indicate your preference.

I. GENERAL INFORMATION

Operation Name County Line Dairy Farm ID Number _____
Applicant Name (printed) Milco Dairy Farm, LLC- Nico Niessen, Owner and Operations Manager
Applicant Consent for This Permit Application Only (initials and date) nn 6-9-15
Applicant Consent for All Future Applications/Correspondence (initials and date) nn 6-9-15

II. NOTIFICATION FORMAT

Applicant should understand that, as a result of consenting to electronic notification, e-mail address(es) listed below will be part of the agency's public record.

Please indicate your preference for the method of receiving these notifications by initialing and dating the appropriate line below and then return the completed form to our office with your application.

Initials	Date (month, day, year)	
<u>nn</u>	<u>June 9-15</u>	Please continue sending via US Postal Service mail.
		OR AND
<u>nn</u>	<u>June 9-15</u>	Please send correspondence to the e-mail address as indicated below: I understand that my e-mail address will be part of the public record. E-mail address: <u>milcomilco@hotmail.com</u>
<u>nn</u>	<u>June 9-15</u>	Please send copies of correspondence for this application to the following consultant e-mail address(es): I understand that this e-mail address will be part of the public record. Consultant e-mail address(es): <u>dgerdeman@npecorp.com</u> <u>mcarr@npecorp.com</u>

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CFO / CAFO APPLICATION PACKET

Fee Transmittal

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

(800) 451-6027 extension 2-4473

INSTRUCTIONS:

This form shall be used to transmit fees for all NPDES CAFO and CFO applications in accordance with 13-18-10-2(a)(5), IC 13-18-20-12, IC 13-18-20-11.5, 327 IAC 15-16-5(a)(2) and (3), 327 IAC 15-16-5(b)(1)(B), and 327 IAC 19-7-1(c)(9). This form is required and supersedes all previous versions. No substitutes, altered or previously supplied forms are permissible. The application fee for each application type is listed in the table below. In the table below, locate the type of application to be submitted and the appropriate application fee amount. Make a check or money order for the appropriate application fee amount listed below payable to the Indiana Department of Environmental Management. For payment by Master Card or Visa please visit the IDEM Cashier's office or contact the office by telephone at 317-232-8705 Monday through Friday between the hours of 9:00am to 3:00pm. Return only Fee Transmittal Form and fee to:

Cashier's Office

Indiana Department of Environmental Management

MC 50-10C

100 North Senate Avenue

Indianapolis, IN 46204

NOTE:

A copy of the check or credit card receipt and a copy of the Fee Transmittal Form must be attached to all other submitted application materials. Submit these copies and all application information to:

Indiana Department of Environmental Management

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

I. APPLICANT INFORMATION

Name:	Milco Dairy Farm, LLC	Farm ID Number:	
Mailing Address:	9305 S CR 275 E		
City:	Lewisville		
State:	IN	ZIP Code:	47352
Telephone:	(765) 524-0664		
Operation County:	Rush		

II. APPLICATION TYPE AND FEE AMOUNT

Application Type	Fee Amount
CFO Approval – Construction and/or Operation (Including Renewals)	
<input checked="" type="checkbox"/> A. Completely New Operation (Currently Undeveloped Site)	\$100.00
<input type="checkbox"/> B. Existing Operation without Existing CFO Approval	
<input type="checkbox"/> C. Existing Operation with Expired CFO Approval	
<input type="checkbox"/> D. Expansion of Operation with Current CFO Approval	
<input type="checkbox"/> E. Amendment of Existing CFO Approval – Permit Condition	\$0.00
<input type="checkbox"/> F. Amendment of Existing CFO Approval – Increase in Animal Capacity	
<input type="checkbox"/> G. CFO Approval Renewal/Manure Management Plan	

APPLICATION TYPE AND FEE AMOUNT (continued)**Application Type****NPDES CAFO Individual Permit – Construction and Coverage**

<input type="checkbox"/>	H.	Completely New Operation (Currently Undeveloped Site)	\$400.00
<input type="checkbox"/>	I.	Existing Operation without Current CFO Approval or NPDES CAFO Permit	
<input type="checkbox"/>	J.	Existing Operation with Current CFO Approval	
<input type="checkbox"/>	K.	Current NPDES CAFO Individual Permit Holder Proposing Construction	

NPDES CAFO Individual Permit – Permit Modification

<input type="checkbox"/>	L.	Construction or Expansion of Storage or Animals – No Permit Extension	\$400.00
<input type="checkbox"/>	M.	No Construction or Expansion of Storage or Animals – No Permit Extension	\$50.00

NPDES CAFO Individual Permit – Renewal

<input type="checkbox"/>	N.	Renewal of Coverage for Operation for Operation with Current NPDES CAFO Individual Permit	\$300.00
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CFO / CAFO APPLICATION PACKET

Animal Capacity

Part of State Form 55051 (R / 11-13)

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Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

(800) 451-6027 extension 2-4473

INSTRUCTIONS:

Complete the table below by listing the total approved capacity of animals confined by the provided animal type listed. For applications which include a construction or expansion proposal, the total number of animals listed should reflect the total proposed maximum for any forty-five (45) day period within a twelve (12) month period as described on the Facility Detail Sheet submitted with the application. For renewal applications, the total number of animals listed should reflect the total approved animal capacity.

ANIMAL INFORMATION

Animal Type		Total Approved Animal Capacity
Swine <i>Weighing More Than Fifty-five (55) Pounds</i>	Finishers	
	Sows	
	Boars	
Swine <i>Weighing Less Than Fifty-five (55) Pounds</i>	Nursery Pigs	
Cattle or Cow/Calf Pairs	Beef Cattle	
	Beef Calves	
	Dairy Heifers	1,400
	Dairy Calves	
Mature Dairy Cattle	Dairy Cattle	
Veal Calves	Veal Calves	
Chickens Other than Laying Hens <i>Other Than a Liquid Manure Handling System</i>	Pullets	
	Broilers	
Laying Hens and Broilers <i>Liquid Manure Handling System</i>		
Laying Hens <i>Other Than a Liquid Manure Handling System</i>		
Turkeys		
Ducks <i>Other Than a Liquid Manure Handling System</i>	Ducks	
Ducks <i>Liquid Manure Handling System</i>		
Sheep and Lambs		
Horses		
Other <i>Specify:</i>		
Total		1,400

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CFO / CAFO APPLICATION PACKET

CFO / CAFO New Construction Permit Application Checklist

Part of State Form 55051 (R / 11-13)
Approved by State Board of Accounts, 2013
Confined Feeding Operation (CFO)
National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
Confined Feeding Section
Office of Land Quality
100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS:

1. The application **must** contain the following information. When specifying the location of an item, include the **Page** or **Drawing Number**.
2. Please mark the **Present** box if the item is in the application.
3. Items in **Bold** must be included or the application will be deemed incomplete and returned to the applicant.

REQUIRED INFORMATION		PRESENT? (Y, N or N/A)
General		
I. Three (3) <u>signed</u> copies of the application packet provided by Indiana Department of Environmental Management (IDEM). One of the copies may be electronic.		Y
II. Application Fee (A copy of the check and the Fee Transmittal Form must be attached.)		
A. CFO \$100		
B. NPDES Individual without construction \$300		Y
C. NPDES Individual with construction \$400		
III. Disclosure Statement		Y
IV. Notification Requirement		Y
A. County Executive / County Commissioner List		Y
B. One-Half Mile List		Y
C. Adjoining Land Owner List		Y
D. Potentially Affected Parties List		Y
1. Copy of the mailing to the adjoining land owners and potentially affected parties		Y
E. Copy of Notification Affidavit		Y
Plot Maps (must be legible)		
I. USDA NRCS Soil Survey Map		Y
A. Location of the waste management system		Y
B. Property boundaries of the confined feeding operation		Y
C. Boundaries of all manure application areas		Y
D. Boundaries of livestock and poultry production areas		Y
E. Available acreage for manure application after calculation setbacks		Y
II. USGS Topographical Map		Y
A. ID public water supply wells within 1,000 feet of the manure storage structure		Y
B. ID public water supply surface intake structures within 1,000 feet of the manure storage structure		Y
C. Location of the waste management system		Y
D. Property boundaries of the confined feeding operation		Y
E. Boundaries of all manure application areas		Y
F. Boundaries of livestock and poultry production areas		Y
G. Available acreage for manure application after calculation setbacks		Y
Farmstead Plan (Must be drawn to approximate scale or show specific distances between waste management system and features listed below that are within 500 feet. Plan must be submitted on paper no less than 8-1/2 x 11 inches in size. Plan must also contain reference to true north.)		
I. Location of existing and proposed waste management systems		Y
II. Location of any of the following within 500 feet of a waste management system (on-site or off-site)		Y
A. Residences		Y
B. Surface waters of the state		Y
C. Public and private roads		Y

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REQUIRED INFORMATION

PRESENT?
(Y, N or N/A)

D. Water well locations	Y
E. Characteristics of karst terrain as identified in 327 IAC 19-2-24	Y
F. Drainage patterns	Y
G. Property boundary line	Y
H. All outfalls of known subsurface drainage structures	Y
I. Drainage inlets, including water and sediment control basins	Y
J. Mortality management sites	Y
III. Show the diversion of uncontaminated surface water	Y
IV. Show the type and number of animals per structure	Y
V. Indicate any part of the CFO that is within 100 year flood plain	N/A

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Unapproved Waste Management System Drawings

I. Detailed views	Y
II. Necessary cross sections to define all dimensions	Y
III. Construction materials	Y
IV. Elevations of the entire waste management system (<i>applicable only if relying on gravity flow</i>)	Y

Soil and Water Table Information

I. Test Holes	Y
A. Must be conducted by certified soil scientist, professional geologist or professional engineer registered in Indiana	Y
B. Number of test holes must be sufficient to adequately characterize the seasonal water table and soil.	Y
1. Concrete storage structures	Y
a. Test hole must be two (2) feet below base of structure	Y
2. Earthen storage structures	Y
a. Test hole must be five (5) feet below base of structure for non-karst area	Y
b. Test hole must be to shallower of either bedrock or ten (10) feet below base of structure in karst area	Y

Manure Management Plan

I. Procedures for soil testing	Y
A. Soil test must provide sufficient information about soil fertility to allow for nutrient recommendations (may not represent more than twenty (20) acres per sample)	Y
B. Frequency of soil test must be specified in the plan and at a minimum be conducted once every four (4) years	Y
II. Procedures for manure testing	Y
A. Manure test must provide sufficient information about manure content to allow for nutrient recommendations	Y
B. Frequency of manure test must be specified in the plan and at a minimum be conducted once every year	Y
C. One (1) manure test must be conducted for each type of manure generated	Y
III. Legible maps of manure application areas	Y
IV. Land use agreements signed by the property owners on whose property the manure will be applied	Y
V. If Applicable	
A. Alternate method proposed by applicant for managing of the manure	N/A
B. Other practices to be used that assure the CFO meet the performance standards of 327 IAC 19-3-1	N/A
C. Land application acreage requirements waiver, as described in 327 IAC 19-14-2(d)	N/A

Nutrient Management Plan (*required for NPDES CAFO Individual permit applicants*)

I. Any NPDES CAFO Individual Permit applicant must submit a nutrient management plan (NMP) with their application materials. The NMP should contain best management practices necessary to meet the requirements listed below, and any applicable effluent limitations and standards, including those specified in 40 CFR part 412. The NMP must, to the extent applicable:	
A. Ensure adequate storage of manure, litter, and process wastewater, including procedures to ensure proper operation and maintenance of the storage facilities	N/A

REQUIRED INFORMATION

PRESENT?
(Y, N or N/A)

B. Ensure proper management of mortalities so that they are not disposed of in a liquid manure, storm water, or process wastewater storage or treatment system that is not specifically designed to treat animal mortalities	N/A
C. Ensure that clean water is diverted, as appropriate, from the production area	N/A
D. Prevent direct contact of confined animals with waters of the United States	N/A
E. Ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants	N/A
F. Identify appropriate site specific conservation practices to be implemented, including buffers or equivalent practices, to control runoff of pollutants to waters of the United States	N/A
G. Identify protocols for appropriate testing of manure, litter, process wastewater, and soil	N/A
H. Establish protocols to land apply manure, litter or process wastewater in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater	N/A
I. Identify specific records that will be maintained to document the implementation and management of the minimum elements above	N/A

Alternate Design or Compliance Approach; Innovative Technology (if applicable)

I. Documentation that indicates that the performance standards in 327 IAC 19-3-1 will be met should include:	
A. Design specification that indicate adequate structural integrity	N/A
B. Protective measures that reduce the potential for spills	N/A
C. Existence of barriers or surface gradient that directs liquid way from features specified for protection	N/A
D. Operational practices that provide additional protection	N/A
E. Threats of adverse impacts to water quality or other specified sensitive areas	N/A
F. Other criteria related to protection of the environment or human health	N/A

Additional Attachments (if applicable)

I. Statement affirming that AFOs adjacent to or contiguous with the CFO are not under common ownership or control of applicant	Y
II. Copies of any written waivers related to reduction of setback distances	N/A
III. Copies of all land use agreements as described in 327 IAC 19-14-2(b)	Y

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CFO / CAFO APPLICATION PACKET Farmstead Plan

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

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100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS:

Farmstead plans must be submitted with applications as directed in the "Application Types and Requirements Worksheet." The farmstead plan must conform with the requirements listed Section I. To ensure completeness of your application, please utilize the checklist in Section I. Additionally, Section IV., the Facility Detail Information sheet, must be completed as described in Section II. Again, to ensure completeness of your application, please utilize the checklist within Section II. Attach your completed farmstead plan and Section IV. Facility Detail Information sheet to this form for submittal.

I. FARMSTEAD PLAN CHECKLIST

<input checked="" type="checkbox"/>	A.	The farmstead plan must be on a sheet no less than eight and one-half ($8\frac{1}{2}$) inches by eleven (11) inches in size.
<input checked="" type="checkbox"/>	B.	The farmstead plan must show all existing and proposed waste management systems, and, within five hundred (500) feet of the waste management systems, the following known features (label each feature): <ol style="list-style-type: none">1. Residences2. Surface waters of the state3. Public and private roads4. Water well locations5. Characteristics of karst terrain as identified in 327 IAC 19-2-246. Drainage patterns7. Property boundary line8. All outfalls of known subsurface drainage structures9. Drainage inlets, including water and sediment control basins10. Mortality management sites
<input checked="" type="checkbox"/>	C.	The farmstead plan must be legible and either: <ol style="list-style-type: none">1. Drawn to approximate scale; or2. Show specific distances between the waste management systems and the features listed immediately above in section B that are within five hundred (500) feet of the existing or proposed waste management system.

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II. FACILITY DETAIL INFORMATION CHECKLIST

Utilizing the directions below, complete the Section IV. Facility Detail Information sheet for all confinement and waste structures present or proposed at the site. If the rows of the provided Section IV. Facility Detail Information sheet are not properly sized for your needs, you may alternatively create your own table with the same column headers and required information listed below.

<input checked="" type="checkbox"/>	A.	Label the Farmstead Plan – The waste management systems (confinement and waste structures) must be uniquely identified on the farmstead plan. Existing structures should be labeled with an "E". Proposed structure should be labeled with a "P". After labeling each building with a "P" or "E", number the structures. Your structures should be labeled as "E1", "E2", "E3", etc; or "P1", "P2", "P3", etc; or a combination of the two. Other unique labeling systems will be accepted.
<input checked="" type="checkbox"/>	B.	Animal Type – Animal type(s) listed on Animal Information Attachment.
<input checked="" type="checkbox"/>	C.	Number of Animals – The MAXIMUM CAPACITY of the unit at any one time.
<input checked="" type="checkbox"/>	D.	Solid or Liquid – Denote if the manure in the unit is handled as a solid or liquid.
<input checked="" type="checkbox"/>	E.	Date Constructed – List the approximate date of construction for existing waste storage structures.
<input checked="" type="checkbox"/>	F.	Water Uses (gallons/unit of time) – If the inside of the building is washed, indicate how much water is used and how often the building is cleaned. Also include any excess non-contact cooling water or drinking water directed to the waste management system.
<input checked="" type="checkbox"/>	G.	Brief Description – Provide a brief description of the facility and waste management system. Indicate if the unit shares manure storage with another unit (i.e. common lagoon system, slurry store, etc.). Previously approved structures must have the approval number and date approved listed.

III. FACILITY DETAIL SHEET EXAMPLES

Example 1

Existing Previously Approved Swine Facility Proposing an Expansion

You are seeking approval for a proposed 1,000 head finishing building with a flush gutter system to a proposed lagoon. The lagoon will service the new building as well as two existing buildings that were approved on 12/17/1994, AW #1234. One of the existing buildings contains 1,500 nursery pigs, the other 300 gestating sows. The new finishing building will be washed out between groups of hogs with about 5,000 gallons of water per cleaning. You labeled the 1,000 head finisher "1" and the lagoon "2" on the farmstead map.

FACILITY DETAIL INFORMATION						
Label on Farmstead Map	Animal Type	Number of Animals	Solid or Liquid	Date Constructed (for existing buildings)	Water Uses (gallons/unit of time)	Brief Description:
P1	Finishing Hogs	1,000	Liquid	N/A	5,000 gallons/3 times a year	A finishing building with flush gutter system to lagoon that will service two (2) other buildings on site.
E1	Nursery Pigs	1,500	Liquid	3/95	N/A	Shallow pits, previously approved on 12/17/1994, AW# 1234. Pit will be connected to new lagoon.
E2	Gestating Sows	300	Liquid	3/95	N/A	Six (6) foot concrete pit, previously approved on 12/17/1994, AW# 1234. Pit will be connected to new lagoon.
P2	N/A	N/A	Liquid	N/A	N/A	A clay lined lagoon will service the proposed building as well as the two (2) buildings previously approved on 12/17/1994, AW#1234

Example 2

Existing Turkey Facility with No Prior Approval Proposing an Expansion

You currently own/operate a 20,000 bird broiler barn that does not require an approval, and wish to expand your operation by adding another 20,000 bird broiler barn and a manure compost building. Your total capacity will rise from 20,000 to 40,000 birds. You now must seek approval for both the existing barn and the proposed barn.

FACILITY DETAIL INFORMATION						
Label on Farmstead Map	Animal Type	Number of Animals	Solid or Liquid	Date Constructed (for existing buildings)	Water Uses (gallons/unit of time)	Brief Description:
E1	Broiler	20,000	Solid	~ 1995	N/A	A broiler barn with earthen floors
P1	Broiler	20,000	Solid	N/A	N/A	A broiler barn with earthen floors
P2	N/A	N/A	Solid	N/A	N/A	Concrete floored, additional manure storage

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CFO / CAFO APPLICATION PACKET
Farmstead Plan (continued)

Part of State Form 55051 (R / 11-13)
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Confined Feeding Operation (CFO)
National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation
(NPDES CAFO)

INDIANA DEPARTMENT OF
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Office of Land Quality
100 North Senate Avenue
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

IV. FACILITY DETAIL INFORMATION

Label on Farmstead Plan	Animal Type	Number of Animals	Solid or Liquid	Date Constructed (for existing buildings)	Water Uses (gallons/unit of time)	Brief Description
See Attached						

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FACILITY DETAIL INFORMATION						
Label on Farmstead Plan	Animal Type	Number of Animals	Solid or Liquid	Date Constructed (for existing buildings)	Water Uses (gal/unit of time)	Brief Description
P-1	Dairy Cows	1400	Liquid	-	Flush (as needed) with lagoon water	Proposed dairy free stall barn-1400 cows
P-2	-	-	-	-	Included in manure/cow/day	Milking parlor and holding pen with wash water taken to center flume.
P-3	-	-	Liquid/ Solid	-	N/A	Proposed Sand Lane (240') and Sand Dewatering Pad (69'x360')
P-4	-	-	Liquid	-	N/A	Proposed Weep Walls (180'x80'x10'each)
P-5	-	-	-	-	N/A	Proposed Silage Bunker with drives
P-6	-	-	Liquid	-	N/A	Proposed Manure Storage Pond #1 Operating Capacity=5.2 Million Gallons
P-7	-	-	Liquid	-	N/A	Proposed Manure Storage Pond #2 Operating Capacity=10.3 Million Gallons
P-8	-	-	Liquid	-	N/A	Proposed Stormwater Runoff Pond #3 Operating Capacity=2.19 Million Gallons

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(800) 451-6027 extension 2-4473

INSTRUCTIONS:

Construction information must be submitted with applications as directed in the "Application Types and Requirements Worksheet." Complete Section I. and the checklists contained in Sections II. through XV. The checklists provide a synopsis of the required construction application details contained in 327 IAC 19 to ensure the submittal of a complete application. It will be helpful to have a copy of the Confined Feeding Operations rule, 327 IAC 19, to use as a reference when completing this form. The checklists below step through the application requirements in 327 IAC 19-12. This form is required and supersedes all previous versions. No substitutes, altered, or previously supplied forms will be accepted.

I. OPERATION LOCATION INFORMATION

- A. Complete the operation location information below using the United States Geological Survey (USGS) topographic map the operation is shown upon.

Dunreith	3	15N	10E
USGS Quadrangle	Section	Township	Range

- B. In space below provide detailed directions from the nearest town to the site of the operation:

From Lewisville, Indiana, go West on SR 40, turn South onto S County Road 15W, at County Line, turn West onto W County Line Road S / E 1200 N. The property will be on the south side in 1/2 mile.

II. WASTE MANAGEMENT SYSTEM DRAWINGS CHECKLIST

Review the waste management system drawing requirements in 327 IAC 19-7-4 and answer the questions below.

	Yes	No	N/A
A. Is a design drawing included for all structures proposed (new/expanded production structure or manure storage structure) or existing (previously unapproved or expired) above what is listed in a current CFO approval or NPDES CAFO permit?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Do the waste management system drawings show detailed views and cross sections to define all dimensions and construction materials?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Do all systems relying on gravity flow provide the required elevations of the entire waste management system that relies on gravity?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

III. SOIL BORINGS CHECKLIST

Review the soil and water table information requirements in 327 IAC 19-7-1(c)(6) and answer the questions below.

	Yes	No	N/A
A. Is the soil and water table information for the test holes for proposed manure storage structures provided from a soil scientist certified under the Federation of Certified Board of Agriculture, Biology, Earth and Environmental Sciences, a professional geologist certified in Indiana under IC 25-17.6, or a professional engineer registered in Indiana?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Are the number of test holes sufficient to adequately characterize the seasonal water table and soil? <ul style="list-style-type: none"> For earthen solid manure storage structures, at least two (2) test holes for the first acre of storage and one (1) additional hole for each additional half acre of storage evenly distributed. For liquid manure storage structures, at least two (2) for the first half acre and one (1) additional hole for each additional half acre of storage evenly distributed. For concrete manure storage structures, at least two (2) to adequately characterize seasonal high water table. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Are all test holes for concrete manure storage structures at least two (2) feet below the base of the structure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Are all test holes for earthen liquid manure storage structures in non-karst areas at least five (5) feet below the base of the structure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Are all test holes for earthen liquid manure storage structures in karst areas to either bedrock or ten (10) feet below base of structure, whichever is shallower?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IV. NEW WASTE MANAGEMENT SYSTEMS SITE RESTRICTIONS CHECKLIST

Review the site restrictions specifically listed in 327 IAC 19-12-2 and answer the questions below.

	Yes	No	N/A
A. Is the new waste management system proposed in karst terrain?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. Is the new waste management system proposed over mines? (underground and reclaimed surface mines)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. If the response to either A. and/or B. above is "Yes", does the application contain the information requested in 327 IAC 19-12-2(b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D. Is the new waste management system proposed in a one hundred (100) year flood plain?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E. If the response to D. above is "Yes", 327 IAC 19-12-2(a)(3) requires the access to the waste management system to be at least two (2) feet above the one hundred (100) year flood plain, provide the information below: <div style="display: flex; justify-content: space-around;"> <div> <u> </u> Feet Above Mean Sea Level Elevation of 100 year flood plain </div> <div> <u> </u> Feet Above Mean Sea Level Elevation of access to waste management system </div> </div>			
F. Is any portion of the waste management system located below the seasonal high water table?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. If the response to F. above is "Yes", does the application show the drainage system, provide details how the water table is lowered and maintained below the base of the waste management system (including proper drainage location, elevation of the entire waste management system, sizing, pumps and emergency power sources if necessary), and show the access point for sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

V. WASTE MANAGEMENT SYSTEM SETBACKS CHECKLIST

Review the waste management system setbacks listed in 327 IAC 19-12-3 and answer the questions below.

A. Does the waste management system comply with the following setbacks detailed in 327 IAC 19-12-3(a), (b), and (e)?

Identifiable Feature at Time of Application	Setback Distance (feet)		Yes	No (see B.)	N/A
	All Waste Management Systems	Solid Manure Storage Structures per 327 IAC 19-12-3(b)			
1. Public water supply well	1,000	1,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Public water supply intake surface intake structure	1,000	1,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Existing off-site residential and public buildings	400	400	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Surface waters of the state	300	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Drainage inlets (including water and sediment control basins)	300	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Sinkholes (as measured from the surficial opening or the lowest point of the feature)	300	100	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Off-site water wells	300	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. On-site water wells	100	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Property lines	100	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Public Roads	100	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
327 IAC 19-12-3(c) and (d) allow for reduced setbacks than listed in A. Does the application request or demonstrate a reduced setback?			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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VI. DESIGN REQUIREMENTS APPLICABLE TO ALL NEW WASTE MANAGEMENT SYSTEMS CHECKLIST

Review the design requirements applicable to all new waste management systems listed in 327 IAC 19-12-4 and answer the following question.

	Yes	No	N/A
Does the application conform with the requirements of 327 IAC 19-12-4?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VII. STORAGE CAPACITY FOR MANURE STORAGE STRUCTURES CHECKLIST

Review the storage capacity requirements for manure storage structures listed in 327 IAC 19-12-4(c) and answer the following question.

	Yes	No	N/A
Does the application conform with the requirements of 327 IAC 19-12-4(c)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VIII. DESIGN REQUIREMENTS APPLICABLE TO ALL NEW LIQUID MANURE STORAGE STRUCTURES CHECKLIST

Review the design requirements applicable to all new liquid manure storage structures in 327 IAC 19-12-4 and answer the following question.

	Yes	No	N/A
Does the application conform with the requirements of 327 IAC 19-12-4(d), (e), and (f)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. DESIGN REQUIREMENTS FOR ALL NEW CONCRETE STORAGE STRUCTURES FOR LIQUID MANURE CHECKLIST

Review the design requirements applicable to all new concrete storage structures for liquid manure in 327 IAC 19-12-4(e) and answer the following questions.

A. Do the waste management concrete storage structure drawings include:	Yes	No	N/A
1. Joints that are properly spaced and sized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Adequate reinforcement steel, size and spacing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. A foundation that provides necessary support?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Use of water stops, locations and type(s) detailed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Concrete specifications demonstrating a concrete mixture that is well proportioned and consolidated included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Concrete specifications demonstrating construction practices to minimize cracking included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

X. DESIGN REQUIREMENTS FOR ALL NEW EARTHEN MANURE STORAGE STRUCTURES FOR LIQUID MANURE CHECKLIST

Review the design requirements for all new earthen manure storage structures for liquid manure in 327 IAC 19-12-5 and answer the following questions.

A. The new structures do not have a seepage rate that exceeds one-sixteenth (1/16 th) inch per day as justified through accompanying justification and calculations.	Yes	No	N/A
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. The manufacturer specifications and installation instructions are included for synthetic and geomembrane liner systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

XI. DESIGN REQUIREMENTS FOR SOLID MANURE STORAGE STRUCTURES CHECKLIST

Review the design requirements for solid manure storage structures in 327 IAC 19-12-4 and answer the following questions.

A.	327 IAC 19-12-4(g) prohibits solid manure storage structures from being constructed in sand or gravel soils, Unified Soil Classifications of Pt, GW, GP, GM, GC, SW, SP, SM, SC, unless specially designed with an approved liner. Does the application propose constructing a solid manure storage structure in a prohibited soil classification listed above?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
B.	If the response to A. above is "Yes", are details regarding the required specially designed liner included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
C.	Run-on and precipitation must be diverted away from solid manure storage structures, unless the design includes a method to collect and manage the contaminated run-off.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

XII. DESIGN REQUIREMENTS APPLICABLE TO OTHER MANURE STORAGE STRUCTURES CHECKLIST

Review the design requirements applicable to other manure storage structures in 327 IAC 19-12-4 and answer the following question.

Does the application conform with the requirements of 327 IAC 19-12-4(h), (i), (j), and (k)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
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XIII. VEGETATIVE MANAGEMENT SYSTEMS CHECKLIST

Review the design requirements applicable to vegetative management systems in 327 IAC 19-12-4 and answer the following question.

Does the application conform with the requirements of 327 IAC 19-12-4(l)? (Indiana NRCS Conservation Practice Standard Code 635:Vegetated Treatment Area; October 2006)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
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XIV. CONSTRUCTED WETLANDS CHECKLIST

Review the design and operation requirements applicable to constructed wetlands 327 IAC 19-12-4 and answer the following question.

Does the application conform with the requirements of 327 IAC 19-12-4(m)? (Indiana NRCS Conservation Practice Standard Code 656:Constructed Wetland; October 2006)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
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XV. ALTERNATE DESIGN CHECKLIST

Review the alternate design requirements applicable to all applications in 327 IAC 19-5-1 and answer the following questions.

A.	Does the application propose any alternate design, compliance approach, or innovative technology?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
B.	If the response to A. above is "Yes", what part of the application proposes any alternate design, compliance approach, or innovative technology? Provide the information below: <hr/>			

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CFO / CAFO APPLICATION PACKET Manure Management Plan (MMP)

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

(800) 451-6027 extension 2-4473

INSTRUCTIONS: The below required information supplements the general information and plot maps attachments for a complete CFO Approval Renewal application or construction application. CFO Approval Renewal applications and construction applications for expansions at currently regulated operations may also utilize the Marketing and Distribution of Manure attachment if appropriate. Complete all portions of the form below. This form is required and supersedes all previous versions. No substitutes, altered, or previously supplied forms are permissible.

I. MANURE MANAGEMENT PLAN

A. Manure Testing

Consult Purdue University Cooperative Extension Service Publications AY-277, ID-101, ID-205 "Swine Manure Management Planning", ID-206 "Poultry Manure Management Planning", ID-208 "Dairy Manure Management Planning" for guidance on procedures for manure testing.

1. Manure Sample Collection Procedures:

Representative samples will be collected from the manure storage structures annually

2. Nutrient Assessment:

- ☒ Private laboratory does a nutrient analysis of sample(s).
☐ Other (explain): _____

3. Sampling Frequency:

- ☐ Annual sampling required for CAFOs with a NPDES permit.
☒ Minimum of once every year for CFOs.

B. Soil Testing

You can consult Purdue University, Cooperative Extension Service Publication AY-281 for guidance on procedures for soil testing. A soil test must provide sufficient information about soil fertility to allow for nutrient recommendations for existing or planned crops. Soil tests may not represent more than twenty (20) acres per sample.

1. Do, or will, you perform soil testing for this operation?

- ☒ Yes, all or a portion of manure is, or will be, applied to land controlled by the operator (complete 2-4 below).
☐ No, 100 % of manure is, or will be, either marketed or distributed (2-4 below do not need to be completed).

2. Sample Collection Method:

- ☒ Management unit (field level)
☐ Grid method
☐ By soil type
☐ Other (explain): _____

3. Nutrient Assessment:

- ☒ Private laboratory does nutrient analysis.
☐ Other (explain): _____

4. Sampling Frequency:

- ☒ Minimum of once every four (4) years for CFOs and CAFOs.

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II. SPRAY IRRIGATION

- A. Does the operation currently, or propose to, apply manure by spray irrigation?
☐ Yes ☒ No
- B. If yes, is the spray irrigation in a flood plain?
☐ Yes ☒ No
- C. CAFOs with NPDES permits must conduct spray irrigation in a flood plain in accordance with the NPDES CAFO individual permit rule for the operation, as applicable.
- D. CFOs may only conduct spray irrigation in a flood plain in accordance with a spray irrigation plan approved by IDEM. (327 IAC 19-14-5(d))

III. SURFACE APPLICATION OF MANURE TO FROZEN OR SNOW-COVERED GROUND

- A. CFOs which are not large CAFO-sized farms and have 120 days or less of approved storage capacity may request approval to surface apply manure to frozen or snow-covered ground based on a case-by-case authorization from the commissioner per 327 IAC 19-14-4(i).
Have you included additional information to obtain or renew a commissioner's authorization?
☐ Yes ☒ No
- B. CAFOs with a NPDES permit and CFOs (not CAFO-sized) with 180 days of approved storage can request approval for surface application of manure to frozen or snow-covered ground under the provisions of 327 IAC 19-5-1 as an Alternate Design or Compliance Approach which meets the performance standards of 327 IAC 19-3-1.
Does the operation plan to submit a request for approval of an Alternate Design or Compliance Approach?
☐ Yes ☒ No
- C. CFOs which are not large CAFO-sized farms may request approval to surface apply manure to frozen or snow-covered ground resulting from an unforeseen emergency condition per 327 IAC 19-14-4(g-h). Improper design or management of manure storage facilities will not qualify as an emergency condition.

IV. CFO APPROVAL RENEWAL INFORMATION

(THIS SECTION IS ONLY FOR CFO APPROVAL RENEWAL APPLICATIONS.)

- A. Farm ID Number: _____
- B. Total number of approved confinement barns currently present at operation: _____
- C. Total number of open confinement lots (earthen or concrete) currently present at operation: _____
- D. Total approved capacity of animals which can be confined at operation: _____
- E. Are earthen lagoon(s) or pit(s) currently present at operation? ☐ Yes ☐ No
- F. Separate from confinement barn(s), are any concrete or metal tanks currently present at operation? ☐ Yes ☐ No
- G. Separate from confinement barn(s), are any solid manure storage building (litterstack, barn, etc.) currently present at operation? ☐ Yes ☐ No
- H. Since the last renewal, have any confinement barns been closed? If yes, detail in I. below which barn(s) and the animal number(s) housed within. ☐ Yes ☐ No
- I. Since last renewal, have any lagoon(s), pit(s), or tank(s) been closed? If yes, detail in I. below which structure(s). ☐ Yes ☐ No
- J. Detail any changes in manure storage capacity or animal capacity (number/species/type) at the operation that have been made since the time of the last CFO approval.

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Plot Maps

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 Confined Feeding Operation (CFO)
 National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

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 Confined Feeding Section
 Office of Land Quality
 100 North Senate Avenue
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 Indianapolis, Indiana 46204
 (800) 451-6027 extension 2-4473

INSTRUCTIONS:

Plot maps must be submitted with applications as directed in the "Application Types and Requirements Worksheet." The specific plot maps which must be submitted for each application type are detailed in Section I. and Section V. The submitted plots must conform with the application requirements noted in Section II., Section III., and Section IV. This form is required and supersedes all previous versions. No substitutes, altered, or previously supplied forms will be accepted.

I. PLOT MAPS

Listed below are plot maps required to be submitted with CFO and CAFO applications. Please note each plot map type is labeled (A, B, and C). Based on the application type previously determined in the "Application Type and Requirements Worksheet" and noted on the "General Information" form, locate the application type in Section V. below. The columns to the right of each listed application type note the required plot maps, as labeled here. As directed in Section I. above, based on the application type determined in the "Application Type and Requirements Worksheet" and noted on the "General Information" form, locate the application type below. The columns to the right of each listed application type note the required plot maps, as labeled in Section I., which are required to be submitted.

- A. USDA NRCS Soil Survey Map – The boundaries of all manure application areas.
- B. USDA NRCS Soil Survey Map – The location of the waste management system, boundaries of the confined feeding operation, and boundaries of livestock and poultry production areas.
- C. USGS Topographic Map – The location of the waste management system, the boundaries of the confined feeding operation, boundaries of livestock and poultry production areas, identify any public water supply wells and public water supply surface intake structures within one thousand (1,000) feet of the manure storage structures, and boundaries of all manure application areas.

II. TOTAL AVAILABLE ACREAGE FOR LAND APPLICATION

- A. Considering setbacks, which must be subtracted from the total acres, and any and all other limitations, what is total acreage available for land application? 894.5
Acres
- B. On all plot maps submitted showing the boundaries of land application areas, note the total available acreage for land application in each separate area considering the applicable setbacks considering land application method and slope.

III. MARKETING AND DISTRIBUTION

For operations utilizing marketing and distribution of manure, refer to the "Marketing and Distribution of Manure" form contained within this application packet. Review the directions on the form carefully for information regarding when a marketing and distribution waiver may be used.

IV. LAND USE AGREEMENTS

Any acreage identified as part of the minimum required acreage for the application of manure that is not owned by the owner of operation must be document in the operating record via land use agreements.

- A. Copies of all land use agreements must accompany construction applications (application types A-D, H-K, and L*).
- B. The land use agreements must be signed by the property owners on whose property the manure will be applied.
- C. Plot maps accompanying construction applications must have the property owner clearly labeled for each land application area submitted.

V. APPLICATION TYPE AND REQUIRED PLOT MAPS

As directed in Section I. above, based on the application type determined in the "Application Type and Requirements Worksheet" and noted on the "General Information" form, locate the application type below. The columns to the right of each listed application type note the required plot maps, as labeled in Section I., which are required to be submitted.

V. APPLICATION TYPE AND REQUIRED PLOT MAPS (Continued)

Application Type		Required Plot Maps (as Labeled in Section I.)		
		A	B	C
CFO Approval – Construction and/or Operation (Including Renewals)				
A.	Completely New Operation (Currently Undeveloped Site)	Yes	Yes	Yes
B.	Existing Operation Without Existing CFO Approval			
C.	Existing Operation with Expired CFO Approval			
D.	Expansion of Operation with Current CFO Approval		No	No
E.	Amendment of Existing CFO Approval – Permit Condition			
F.	Amendment of Existing CFO Approval – Increase in Animal Capacity			
G.	CFO Approval Renewal/Manure Management Plan			
NPDES CAFO Individual Permit – Construction and Permit Coverage				
H.	Completely New Operation (Currently Undeveloped Site)	Yes	Yes	Yes
I.	Existing Operation without Current CFO Approval or NPDES Permit			
J.	Existing Operation with Current CFO Approval			
K.	Current NPDES CAFO Individual Permit Holder Proposing Construction			
NPDES CAFO Individual Permit - Permit Modification				
L.	Construction or Expansion of Storage or Animals – No Permit Extension	Yes	Yes	Yes*
M.	No Construction or Expansion of Storage or Animals – No Permit Extension			No
NPDES CAFO Individual Permit – Renewal				
N.	Renewal Coverage for Operation with Current NPDES CAFO Individual Permit	Yes	Yes	No

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CFO / CAFO APPLICATION PACKET

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100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS: Indiana's Confined Feeding Control Law requires disclosure statements regarding certain alleged material violations of environmental laws with all applications which propose construction of a confined feeding operation or expansion of a confined feeding operation that increases animal capacity or manure storage capacity, or both. (See IC 13-18-10-1.4; IC 13-18-10-2.1; IC 13-11-2-8(a); IC 13-11-2-158(b); and IC 13-11-2-191 to review the laws that apply to this form.)

Section I of this form helps applicants identify responsible parties associated with their application.
Section II helps applicants determine whether each responsible party must submit a disclosure statement.
Section III helps each responsible party submit a complete disclosure statement.

Follow the instructions in each section of this form. This form is required and supersedes all previous versions.

Applicant Information:

An applicant may be an individual, a partnership, a copartnership, a firm, a company, a corporation, an association, a joint stock company, a trust, an estate, a political subdivision, a state agency, or other legal entity, or their legal representative, agent, or assigns. (See IC 13-11-2-8 and IC 13-11-2-158) The applicant(s) listed on this form should match the applicant(s) listed on the first page of the application packet.

Applicant(s):	Milco Dairy Farm, LLC	Farm ID Number	
Contact Person:	Nico Niessen	(Provide Farm ID number if expanding an existing operation.)	
Business Address:	9305 S CR 275 E	Telephone:	765-524-0664
City:	Lewisville	State:	IN
		ZIP Code:	47352

Section I. List of Responsible Parties:

List each responsible party associated with the application.

A disclosure statement is required for each Responsible Party, as defined under IC 13-11-2-191. The Responsible Parties includes each owner/operator defined under 327 IAC 19-2-32 and its respective officers, corporate directors, or senior management officials.

The applicant(s) may have multiple responsible parties. Attach additional sheets as necessary.

Responsible Party 1

Name:	Nico Niessen		
Business Address:	9305 S CR 275 E	Telephone:	765-524-0664
City:	Lewisville	State:	IN
		ZIP Code:	47352
Relationship to Applicant:	Member		

Responsible Party 2

Name:	Milly Niessen		
Business Address:	9305 S CR 275 E	Telephone:	765-524-0676
City:	Lewisville	State:	IN
		ZIP Code:	47352
Relationship to Applicant:	Member		

Responsible Party 3

Name:			
Business Address:		Telephone:	
City:		State:	
		ZIP Code:	
Relationship to Applicant:			

Section II. Determining responsible parties who must provide a disclosure statement:

Indiana's Confined Feeding Control Law requires a disclosure statement for alleged violations of environmental law that meet the criteria noted in IC 13-18-10-1.4(a) & (b). This section helps applicants determine whether the responsible parties have violations that meet these criteria.

You may group responsible parties who have identical responses to the questions in this section by listing multiple names or responsible party numbers in the space provided. Provide additional copies of this page as needed to complete this section for all responsible parties listed in Section I.

Responsible Party Name(s) or Number(s)
from Section I (type or print) Nico Niessen

Note: This section applies to material violations alleged in any state of the United States, and in any other country.

A. Answer both questions 1 and 2 below:

1. Have any state or federal officials at any time alleged that the responsible party or parties committed acts or omissions that constitute a material violation of state or federal environmental law?
☒ Yes ☐ No
2. Have foreign officials at any time alleged that the responsible party or parties committed acts or omissions that constituted a material violation of foreign environmental law, and that would have constituted a material violation of state or federal environmental law if the act or omission had occurred in the United States?
☐ Yes ☒ No

If the answer to both questions is "No," a disclosure statement is not required. Skip to item D below.

B. Indiana's Confined Feeding Control Law requires the responsible party or parties to submit the disclosure statement required by IC 13-18-10-1.4(c) only if the alleged acts or omissions acknowledged by a "Yes" answer to questions A1 or A2 above presented a substantial endangerment to human health or the environment.

If the alleged acts or omissions presented a substantial endangerment to human health or the environment, skip to Section III to prepare and submit the disclosure statement.

Otherwise, proceed to item C on the this page.

C. If the alleged acts or omissions acknowledged by a "Yes" answer to questions A1 or A2 above **did not** present a substantial endangerment to human health or the environment, the responsible party or parties do not have to submit a disclosure statement in Section III. However, consistent with IDEM's authority to conduct an inquiry or investigation under IC 13-18-10-2.1(a)(2), the responsible party or parties must attach the following information:

1. The name and address of the government entity that alleged the acts or omissions.
2. A description of the information relied upon in determining that the alleged acts or omissions ~~did not~~ present a substantial endangerment to human health or the environment. Provide the name and qualifications of the person(s) who made the determination.

☐ Not Applicable ☒ Provided

Proceed to item D on this page.

D. If directed here by items A or C, the responsible party or parties listed on this page are not required to complete Section III, the disclosure statement required by IC 13-18-10-1.4(c). The applicant or responsible party must attach the information required in item C if applicable, and sign and date below. Their disclosure submittal is complete.

Per IC 13-18-10-2.1(e)(1)(A), the commissioner may deny an application if a responsible party intentionally misrepresents or conceals any material fact in an application for approval under IC 13-18-10.

I affirm that all information submitted in this form and any attachments is, to the best of my knowledge and belief, true, accurate, and complete. I am aware of the penalties for submitting false information under IC 13-18-10-1.4, IC 13-30-10-1.5 and IC 35-44-2-1.

Applicant or

Responsible Party Signature: Nico Niessen

Printed Name: Nico Niessen

Date Signed: June 9-2015

(month, day, year)

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Section II. Determining responsible parties who must provide a disclosure statement:

Indiana's Confined Feeding Control Law requires a disclosure statement for alleged violations of environmental law that meet the criteria noted in IC 13-18-10-1.4(a) & (b). This section helps applicants determine whether the responsible parties have violations that meet these criteria.

You may group responsible parties who have identical responses to the questions in this section by listing multiple names or responsible party numbers in the space provided. Provide additional copies of this page as needed to complete this section for all responsible parties listed in Section I.

Responsible Party Name(s) or Number(s)
from Section I (type or print)

Milly Niessen

Note: This section applies to material violations alleged in any state of the United States, and in any other country.

A. Answer both questions 1 and 2 below:

1. Have any state or federal officials at any time alleged that the responsible party or parties committed acts or omissions that constitute a material violation of state or federal environmental law?
☒ Yes ☐ No
2. Have foreign officials at any time alleged that the responsible party or parties committed acts or omissions that constituted a material violation of foreign environmental law, and that would have constituted a material violation of state or federal environmental law if the act or omission had occurred in the United States?
☐ Yes ☒ No

If the answer to both questions is "No," a disclosure statement is not required. Skip to item D below.

B. Indiana's Confined Feeding Control Law requires the responsible party or parties to submit the disclosure statement required by IC 13-18-10-1.4(c) only if the alleged acts or omissions acknowledged by a "Yes" answer to questions A1 or A2 above presented a substantial endangerment to human health or the environment.

If the alleged acts or omissions presented a substantial endangerment to human health or the environment, skip to Section III to prepare and submit the disclosure statement.

Otherwise, proceed to item C on this page.

C. If the alleged acts or omissions acknowledged by a "Yes" answer to questions A1 or A2 above ~~did not~~ present a substantial endangerment to human health or the environment, the responsible party or parties do not have to submit a disclosure statement in Section III. However, consistent with IDEM's authority to conduct an inquiry or investigation under IC 13-18-10-2.1(a)(2), the responsible party or parties must attach the following information:

1. The name and address of the government entity that alleged the acts or omissions.
2. A description of the information relied upon in determining that the alleged acts or omissions did not present a substantial endangerment to human health or the environment. Provide the name and qualifications of the person(s) who made the determination.

☐ Not Applicable ☒ Provided

Proceed to item D on this page.

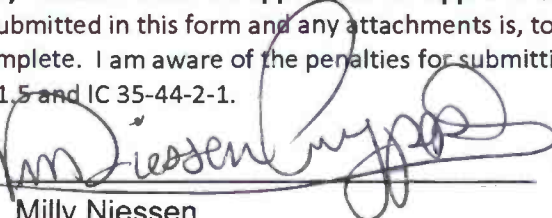
D. If directed here by items A or C, the responsible party or parties listed on this page are not required to complete Section III, the disclosure statement required by IC 13-18-10-1.4(c). The applicant or responsible party must attach the information required in item C if applicable, and sign and date below. Their disclosure submittal is complete.

Per IC 13-18-10-2.1(e)(1)(A), the commissioner may deny an application if a responsible party intentionally misrepresents or conceals any material fact in an application for approval under IC 13-18-10.

I affirm that all information submitted in this form and any attachments is, to the best of my knowledge and belief, true, accurate, and complete. I am aware of the penalties for submitting false information under IC 13-18-10-1.4, IC 13-30-10-1.5 and IC 35-44-2-1.

Applicant or

Responsible Party Signature:



Date Signed:

June 9 - 2012
(month, day, year)

Printed Name: Milly Niessen

Section C.

1. *The name and address of the government entity that alleged the acts or omissions.*
IDEM- 100 North Senate Ave, Indianapolis, IN 46204
2. *A description of the information relied upon in determining that the alleged acts or omissions did not present a substantial endangerment to human health or the environment. Provide the name and qualifications of the person(s) who made the determination.*

A review of IDEM's Virtual File Cabinet and a discussion with the owner identified only the following violations and enforcement actions within the past 5 years. Our review and any subsequent opinions are based only upon this information.

- a) Agreed order between Milco Dairy Farm and IDEM were adopted on August 23, 2012. These orders were from a February 17, 2012 IDEM inspection for violations of construction of a 72' barn extension and a calf barn without approval from IDEM. A fine of \$4,000 was paid and the conditions of the orders were met and the resolution of this case was on January 23, 2013.
- b) An August 5, 2014 inspection resulted in an alleged violation regarding stormwater management, constructing without a permit, and waste storage in unpermitted area. Milco Dairy corrected these violations and the case was not taken to enforcement by IDEM.
- c) Agreed order between Milco Dairy Farm and IDEM on July 13, 2004 for not constructing the manure control facility in compliance with the CFO approval. Milco Dairy complied with these orders.

The definition that an event did not "present a substantial endangerment to human health or the environment" can be very subjective. It is our application that if the event did not result in a material release of manure to the environment, it did not pose a substantial threat.

Using that basis, and based upon the fact that manure was not allowed into the environment in the above events, it is our opinion that these above violations did not present a substantial endangerment to human health or the environment. This determination was made by David Gerdeman, a registered professional engineer and Principal Engineer with North Point Engineering. His determination is based upon review of the violation report(s) from IDEM and information provided by Nico Niessen.

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CFO / CAFO APPLICATION PACKET Notification Requirements

Part of State Form 55051 (R / 11-13)
Approved by State Board of Accounts, 2013
Confined Feeding Operation (CFO)
National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

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DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
Confined Feeding Section
Office of Land Quality
100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS: This form is provided by the department to you, the applicant, to supply all applicable notification requirements placed on you by IC 13-18-10, 327 IAC 19, and 327 IAC 15-16 to be met in order to ensure proper issuance. This form is required and supersedes all previous versions. No substitutes, altered, or previously supplied forms will be accepted.

I. NOTIFICATION REQUIREMENTS

A. Answer all four questions below. If an action is listed to the right of your answer, complete the section(s) listed. If none of your answers require an action, then no notice is required and the form is complete. If further action is required, read Section I.B. and Section I.C. below regarding proper notice requirements, materials, and certification.

1. Does the application propose construction of a new confined feeding operation (CFO) or an expansion through construction of an existing CFO?
- | | | |
|---|-----------------|--|
| <input checked="" type="checkbox"/> Yes | Complete | Section II.A. County Executive / County Commissioner List
Section II.B. One-Half (1/2) Mile List
Section II.C. Adjoining Land Owner List
Section III. Potentially Affected Parties List |
| <input type="checkbox"/> No | | |

2. Is the application for an amendment to the CFO approval? For example, does the application propose expansion without construction of a CFO that increases animal capacity or a permit condition?
- | | | |
|--|-----------------|--|
| <input type="checkbox"/> Yes | Complete | Section II.A. County Executive / County Commissioner List
Section II.C. Adjoining Land Owner List |
| <input checked="" type="checkbox"/> No | | |

3. Does the operation have a current CFO approval?
- | | | |
|--|-----------------|--|
| <input type="checkbox"/> Yes | | Notification is not required if application is an Approval Renewal/MMP. |
| <input checked="" type="checkbox"/> No | Complete | Section II.A. County Executive / County Commissioner List
Section II.B. One-Half (1/2) Mile List
Section II.C. Adjoining Land Owner List
Section III. Potentially Affected Parties List |

4. Is the application for a NPDES CAFO Individual permit coverage, modification, or renewal?
- | | | |
|--|-----------------|--|
| <input type="checkbox"/> Yes | Complete | Section II.A. County Executive / County Commissioner List
Section II.C. Adjoining Land Owner List
Section III. Potentially Affected Parties List |
| <input checked="" type="checkbox"/> No | | |

B. The *Notification of Application Submittal* form is included for your use. The notice is required to:

1. Be provided not more than ten (10) working days after submitting an application to all individuals listed in Section II.A., Section II.B., and Section II.C. generated as directed in Section I.A. above;
2. Be sent by mail;
3. Be in writing;
4. Include the date on which the application was submitted to IDEM; and
5. Include a brief description of the application, such as permit type, location, animal type(s), animal numbers, numbers and types of barns and storage structures, and methods of manure application; and
6. Be paid for by the applicant.

C. If a notice is required as directed in Section I.A., an applicant must certify to IDEM the notice was completed in compliance with requirements of Section I.B. listed above. The certification to IDEM must be included with the submitted application and must contain:

1. The enclosed *Notification Affidavit* which is completed, signed, and notarized;
2. The lists generated as directed by all four answers provided in Section I.A.; and
3. A copy of the notice described Section I.B. above.

II. PARTIES NOTIFIED BY APPLICANT

A. County Executive / County Commissioner List

Required when applicable by IC 13-18-10-2(b)(1) and 327 IAC 19-8-7(a)(1)

To complete this section, list the county executive/county commissioners for the county in which the confined feeding operation is to be located or expanded. Attach additional sheets as necessary.

1.	Name	Bruce Levi, County Commissioner				
	Mailing address (number and street)	101 East Second Street, Room 102				
	City	Rushville	State	IN	ZIP code	46173
2.	Name	Mark Bacon, County Commissioner				
	Mailing address (number and street)	101 East Second Street, Room 102				
	City	Rushville	State	IN	ZIP code	46173
3.	Name	Paul Wilkinson, County Commissioner				
	Mailing address (number and street)	101 East Second Street, Room 102				
	City	Rushville	State	IN	ZIP code	46173
4.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
5.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
6.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	

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B. One-Half (1/2) Mile List

Required when applicable by IC 13-18-10-2(b)(2) and 327 IAC 19-8-7(a)(2)

To complete this section, the applicant must, to the best of their ability, list all known persons described below:

- Each owner and each occupant of land of which any part of the boundary is one-half (1/2) mile or less from any part of the proposed footprint of either a livestock or poultry production structure, a permanent manure storage structure, or both, on the land on which the confined feeding operation is to be located; and
- Each owner and each occupant of land of which any part of the boundary is one-half (1/2) mile or less from any part of the proposed footprint of either a livestock or poultry production structure, the expanded area of a livestock or poultry production structure, or both, on the land on which the confined feeding operation is to be expanded.

Attach additional sheets as necessary.

1.	Name	SEE ATTACHED LIST				
	Mailing address (number and street)					
	City		State		ZIP code	
2.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	

II. PARTIES NOTIFIED BY APPLICANT (Continued)**C. Adjoining Land Owner List****Required when applicable by 327 IAC 15-16-5(a)(4) and 327 IAC 19-7-1(c)(8)**

This section may solicit individuals listed in Section II.B. above. It is not necessary to list previously listed individuals more than once. This section is explicitly seeking adjoining property owners to the operation that are outside of the one-half (1/2) mile distance listed above and who were not listed in Section B. To complete this section, the applicant must, to the best of their ability, list all known persons described below if not already done so in Section B above:

1. Each person who owns land that adjoins the land on which the confined feeding operation is to be located; or
2. If a person who owns land that adjoins the land on which the confined feeding operation is to be located does not occupy the land, all occupants of the land.

Attach additional sheets as necessary.

1.	Name	SEE ATTACHED LIST				
	Mailing address (number and street)					
	City		State		ZIP code	
2.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
3.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
4.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
5.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
6.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
7.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
8.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
9.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
10.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	

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NOTIFICATION LIST ATTACHMENT- 1/2 Mile List & Adjoining Properties for Milco Dairy II

Adjoining	Owner	Mailing Address	
	GILLESPIE, C & J FARMS LLC	9507 S COUNTY ROAD 125 E	Lewisville, IN 47352
	DELAY, ROSS L	2213 E 1200 N	Lewisville, IN 47352
Yes	DELAY FARMS LLC	10983 N 150 E	Lewisville, IN 47352
Dairy	MILCO DAIRY FARM, LLC	9305 S CR 275 E	Lewisville, IN 47352
Yes	HALEY, JAMES A TESTAMENTARY TRUST	11507 N 300 E	Lewisville, IN 47352
	MC FARLAND, DAVID RALPH REV TR	8848 S COUNTY ROAD 125 W	Lewisville, IN 47352
	SURFACE-RUSSELL, DOROTHY ELAINE	11428 N 100 E	Lewisville, IN 47352
	KNECHT, GARY R & BEVERLY A	3361 E COUNTY ROAD 500 N	Greensburg, IN 47240
	BIEHL, MICHAEL DON SR & SHIRLEY A	2658 E 1100 N	Lewisville, IN 47352
	WHITE, MARY E	2482 E 900 N	Rushville, IN 46173
Yes	KITCHEN DANCE LLC C/O Beverly Ann Norwood	300 Duncan St	Raleigh, NC 27608
	CJ GILLESPIE FARMS LLC	9507 S County Road 125 E	Lewisville, IN 47352
	HOUSE OF PRAYER MIINISTRIES INC	9630 S County Road 25 W	Lewisville, IN 47352
	BRIAR DOUGLAS DEBORAH K	9900 S County Road 25 W	Lewisville, IN 47352
	NIESSEN NICO MILLY	9305 S County Road 275 E	Lewisville, IN 47352
	WILKINS DANIEL	9680 S County Road 25 W	Lewisville, IN 47352
	BURKMAN DIANNE R	400 E County Line Rd	Lewisville, IN 47352

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III. POTENTIALLY AFFECTED PARTIES

Required when applicable by 327 IAC 5-3-12, and 327 IAC 19-7-1(c)(8)

This section is explicitly seeking additional applicant identified potentially affected parties which are not required to be listed in Section II. It is not necessary to list individuals already included in Section II. Attach additional sheets as necessary.

1.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
2.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
3.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
4.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
5.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
6.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
7.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
8.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
9.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
10.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	
11.	Name					
	Mailing address (number and street)					
	City		State		ZIP code	

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**CFO / CAFO APPLICATION PACKET****Notification of Application Submittal**

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

**INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT**

Confined Feeding Section

Office of Land Quality

100 North Senate Avenue

MC 65-45, IGCN 1101

Indianapolis, Indiana 46204

(800) 451-6027 extension 2-4473

You are hereby notified, in accordance with IC 13-18-10-2(b), or 327 IAC 19-7-1 when applicable, that an application has been made to the Indiana Department of Environmental Management (IDEM) for the following described operation:

Applicant / Operation name County Line Dairy (Operated by Milco Dairy, LLC)Date application submitted / will be submitted (required) June 12th, 2015

(month, day, year)

Operation permit type (applicable regulations)

☒ CFO Approval (IC 13-18-10 and 327 IAC 19)☐ NPDES CAFO Individual Permit (IC 13-18-10 and 327 IAC 15-16)**RECEIVED****JUN 15 2015**DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

Operation Location

Nearest crossroads / address 2625 E 1200 NNearest city / town LewisvilleCounty RushPolitical township WashingtonUSGS section/Township/Range Section 3, T 15N, R 10E

Brief description of application

(including animal type(s), animal numbers, numbers and types of barns and storage structures, and methods of manure application)

A proposed confined feeding operation for 1,400 dairy cattle. The facility includes a freestall barn, a milking center, sand lane, and a 3 stage manure pond system.

Questions regarding the location or other aspects of the application should be addressed to

Applicant's name Milco Dairy, LLC- Nico NiessenAddress (number and street) 9305 S CR 275 ECity / State / ZIP code Lewisville, IN 47352Telephone number 765-524-0664

If the application identified above is found to meet requirements set forth in IC 13-18-10, 327 IAC 15-16, and 327 IAC 19 as applicable, the application will be approved by IDEM.

IDEM will accept written public comments for thirty-three (33) days following the date of the applicant mailing to the notified parties. Comments may be mailed to the address listed at the top of this sheet. Program questions may be directed to (800) 451-6027, extension 2-4473, or (317) 232-4473.



CFO / CAFO APPLICATION PACKET

Notification Affidavit

Part of State Form 55051 (R / 11-13)

Approved by State Board of Accounts, 2013

Confined Feeding Operation (CFO)

National Pollutant Discharge Elimination System Concentrated Animal Feeding Operation (NPDES CAFO)

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Confined Feeding Section
Office of Land Quality
100 North Senate Avenue
MC 65-45, IGCN 1101
Indianapolis, Indiana 46204
(800) 451-6027 extension 2-4473

INSTRUCTIONS: If a notice is required as directed in Section I.A. on the Notification Requirements Attachment form, the applicant must submit an affidavit to IDEM that certifies the notice requirements, as listed in Section I.B. on the Notification Requirements Attachment form, were complied with. The certification to IDEM must contain this completed Notification Affidavit form. This affidavit is required and supersedes all previous versions. No substitutes, altered, or previously supplied affidavits are permissible.

Nico Niessen, being first duly sworn under oath, deposes and says:

- I live in Henry County, Indiana, and being of sound mind and over twenty-one (21) years of age I am competent to give this affidavit.
- I hold the position of Member for Milco Dairy Farm, LLC.
(Title of Affiant) (Name of Applicant or Operation)
- By virtue of my position, I am authorized to make the representation contained in this affidavit on behalf of the operation.
- As required by IC 13-18-10-2(b), or 327 IAC 19-7-1 when applicable, the applicant will mail written notice to all required persons detailed on the Notification Requirements form not more than ten (10) days after submission of the accompanying application on behalf of County Line Dairy-Milco Dairy Farm.
(Name of Applicant or Operation)
- The written notice mailed to all required persons will include a brief description of the application, such as permit type, location, animal type(s), animal numbers, numbers and types of barns and storage structures, and methods of manure application.

Further Affiant Saith Not.

I affirm under the penalty for perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Responsible party signature

[Signature]

Date signed (mm, dd, yy)

06/09/2015

State of Indiana

County of Henry

Before me, the undersigned, a Notary Public in and for said County and State, personally

appeared Nico Niessen known by me to be the person who executed the foregoing instrument, signed the same and acknowledged to me that he/she did so sign the same, and that his/her free act and deed and that the statements made in the foregoing instrument are true.

IN WITNESS WHEREOF, I have set my hand and official seal this 9th day of June, 20 15.

Signature

[Signature]

Printed

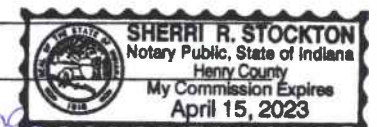
Sherri B. Stockton

My commission expires (month, day, year)

04/15/2023

Residence of

Henry County, Indiana



Soil Map—Rush County, Indiana

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Map Scale: 1:3,380 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

- Waste Management System Boundary
- Livestock Production Area



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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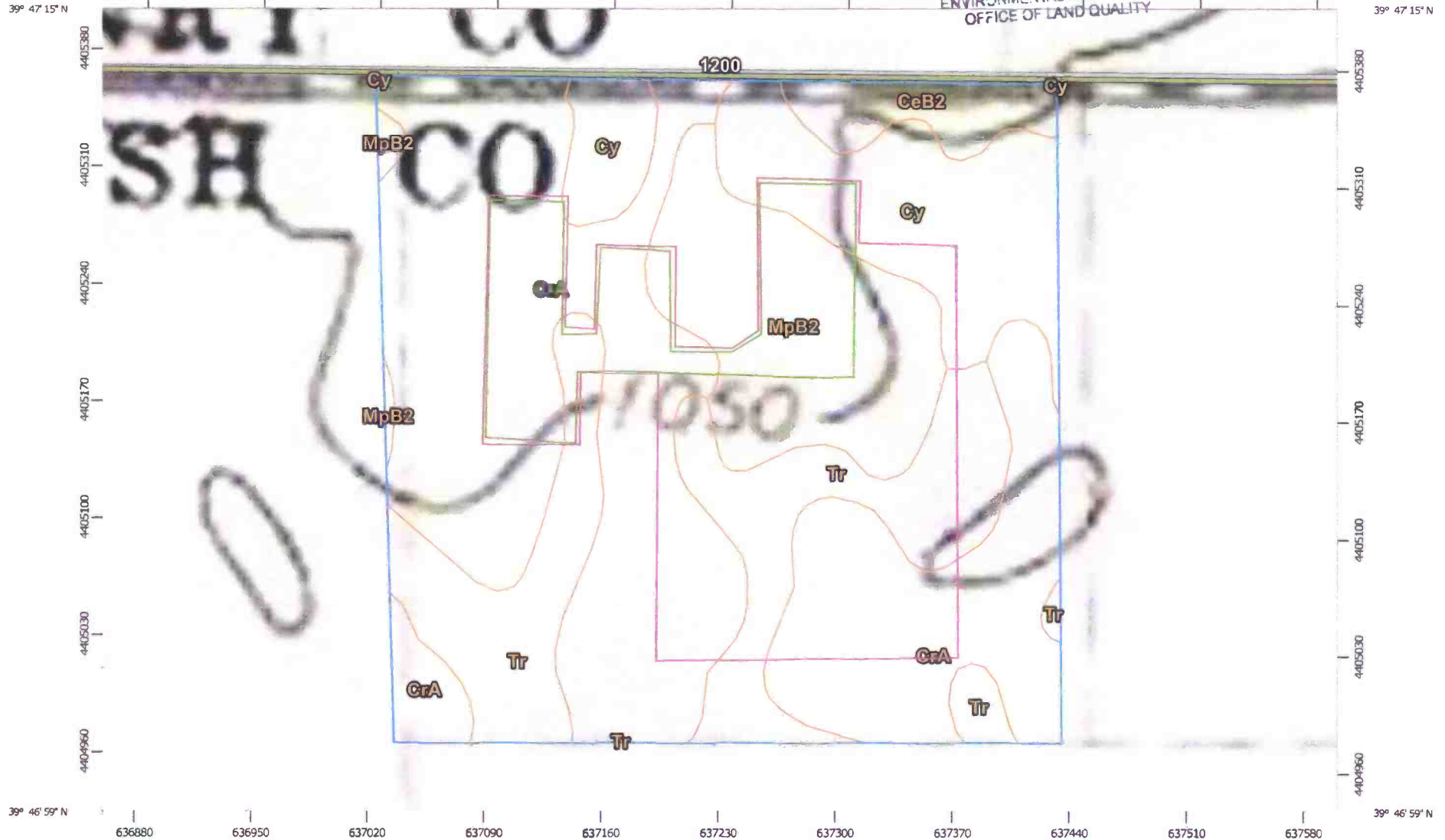
2/25/2015
Page 1 of 3

Soil Map—Rush County, Indiana

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Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

2/25/2015
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rush County, Indiana
Survey Area Data: Version 18, Sep 11, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 2, 2011—Apr 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Map Unit Legend

Rush County, Indiana (IN139)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded	1.3	3.3%
CrA	Crosby silt loam, 0 to 2 percent slopes	19.8	49.9%
Cy	Cyclone silty clay loam	5.6	14.0%
MpB2	Miamian silt loam, New Castle Till Plain, 2 to 6 percent slopes, eroded	5.6	14.0%
Tr	Treaty silty clay loam	7.4	18.8%
Totals for Area of Interest		39.7	100.0%

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COUNTY LINE DAIRY- Land Application Fields						
FIELD	COUNTY	TOWNSHIP	SECTION	OWNER/FARM MANAGER	TOTAL ACRES	SPREADABLE ACRES
A	HENRY	FRANKLIN	14/13	McFarland	320	278.8
B	HENRY	FRANKLIN	34	McFarland	320	305.4
C	HENRY	FRANKLIN	27	McFarland	63	40.9
D	HENRY	FRANKLIN	34	McFarland	19.4	17.7
E	RUSH	CENTER	4	McFarland	230	227.4
F	RUSH	WASHINGTON	3	McFarland	25	24.3
				TOTALS	977.4	894.5

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National Pollutant Discharge Elimination System
Concentrated Animal Feeding Operation Program



Land Use Agreement

Required Information

I, Ken J McFarland (Landowner name), hereby give permission
to County Line Dairy (Producer), who owns a concentrated animal feeding operation located
at 1625E 1900 N, in Rush County, to land apply manure for use as a
fertilizer to my land, located at see Attached list in Henry County under the
following terms and conditions:

1. The Producer will manage, store, transport and spread the manure to ensure that there is no discharge from the manure to surface waters, including but not limited to ditches, streams, ponds, lakes, rivers and drainage inlets.
2. This agreement between the Producer and the Landowner shall be in effect for a term of 10 years unless terminated by either party upon 30 days notice.

Optional Conditions of the Land Use Agreement (check all that will apply):

- ☒ The Producer will land apply the manure in accordance with accepted agronomic rates of the receiving crop based upon soil samples (taken within the previous three (3) years) provided by the Landowner.
- ☒ The Producer will provide to the Landowner a written total of the amount of manure applied and the location of applied manure within _____ days of completion of the application.
- ☒ The Producer will provide the Landowner with laboratory results of the manure, including but not limited to, total available nitrogen, total and/or available phosphorus, and total potassium.
- ☒ The Producer will ensure soil productivity and prevent soil compaction by avoiding application to wet soils.

Specific Conditions Agreed Upon by the Landowner and Producer:

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IN WITNESS WHEREOF, the parties agree to this agreement and have set their hands and seals on the date(s) indicated.

PRODUCER

LANDOWNER

[Signature] 4/8/15
Signature and Date

[Signature] 4/8/15
Signature and Date

National Pollutant Discharge Elimination System
Concentrated Animal Feeding Operation Program



Land Use Agreement

Required Information

I, Ken J. A. Farland (Landowner name), hereby give permission
to County Line Dairy (Producer), who owns a concentrated animal feeding operation located
at 2625 E 1200 N, in Rush County, to land apply manure for use as a
fertilizer to my land, located at see Attached list in Rush County under the
following terms and conditions:

1. The Producer will manage, store, transport and spread the manure to ensure that there is no discharge from the manure to surface waters, including but not limited to ditches, streams, ponds, lakes, rivers and drainage inlets.
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- ☒ The Producer will land apply the manure in accordance with accepted agronomic rates of the receiving crop based upon soil samples (taken within the previous three (3) years) provided by the Landowner.
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- ☒ The Producer will ensure soil productivity and prevent soil compaction by avoiding application to wet soils.

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IN WITNESS WHEREOF, the parties agree to this agreement and have set their hands and seals on the date(s) indicated.

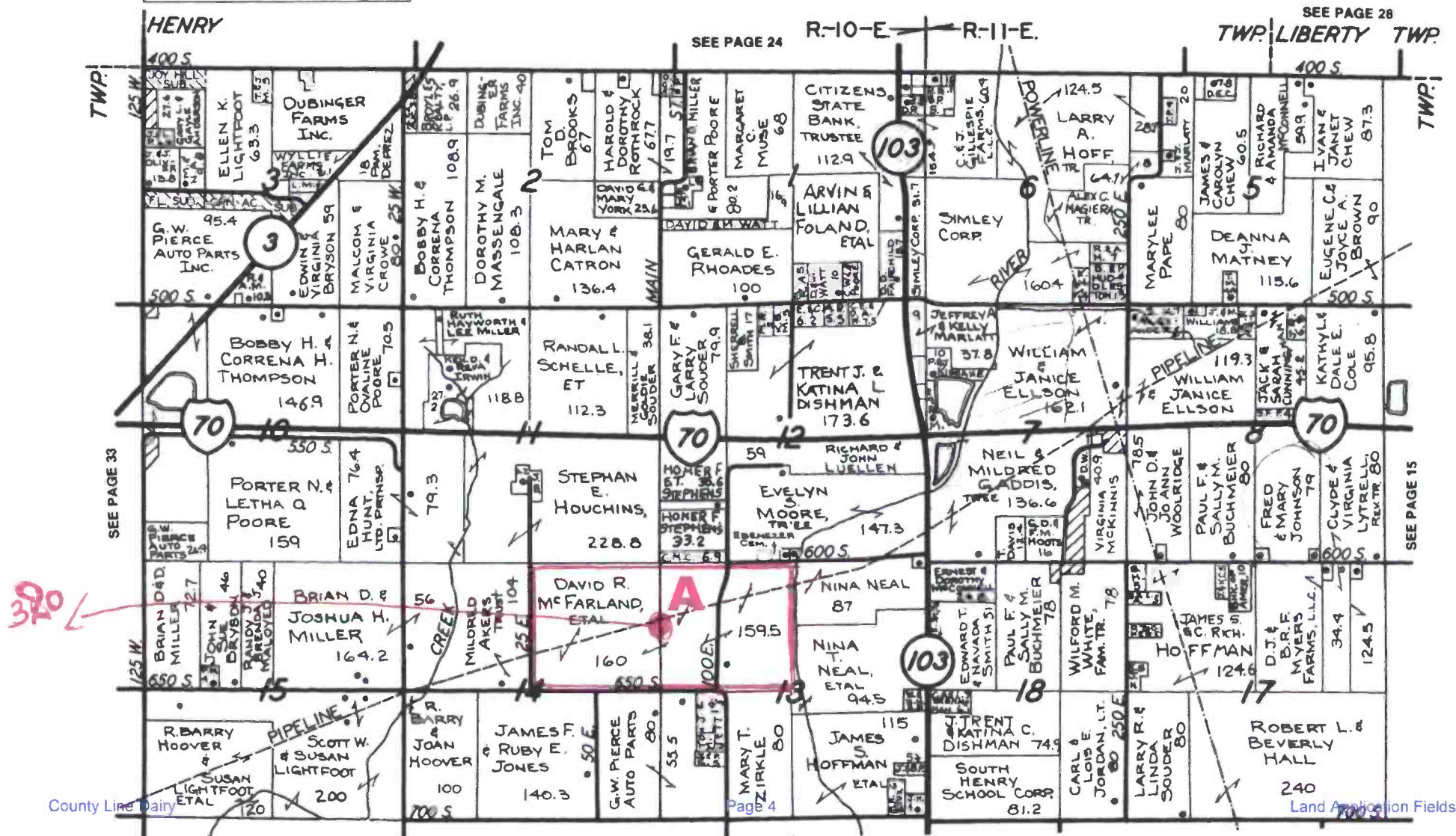
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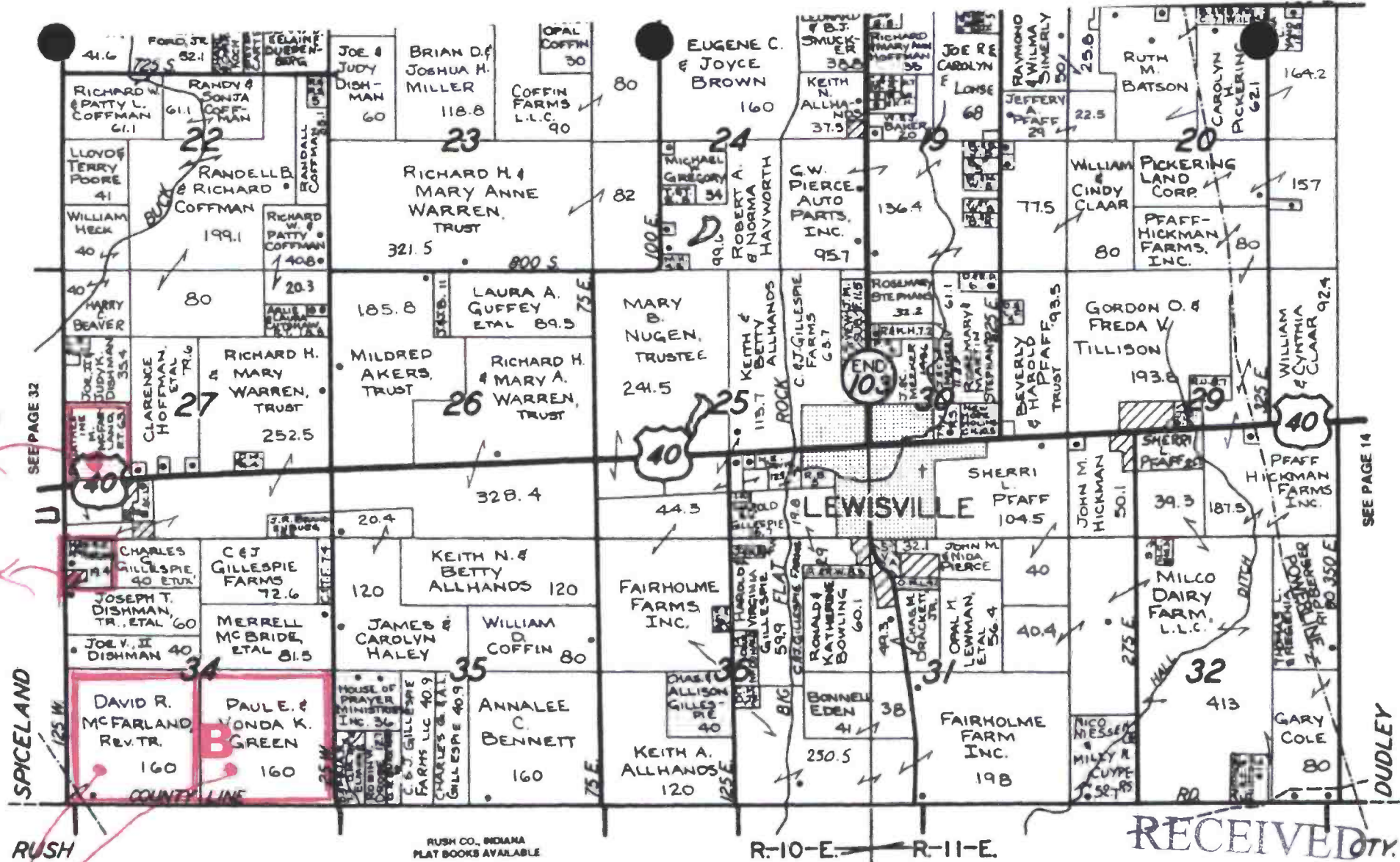
LANDOWNER

AA Jensen 4/8/15
Signature and Date

W. A. Farland 4/8/15
Signature and Date

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Title & Abstract

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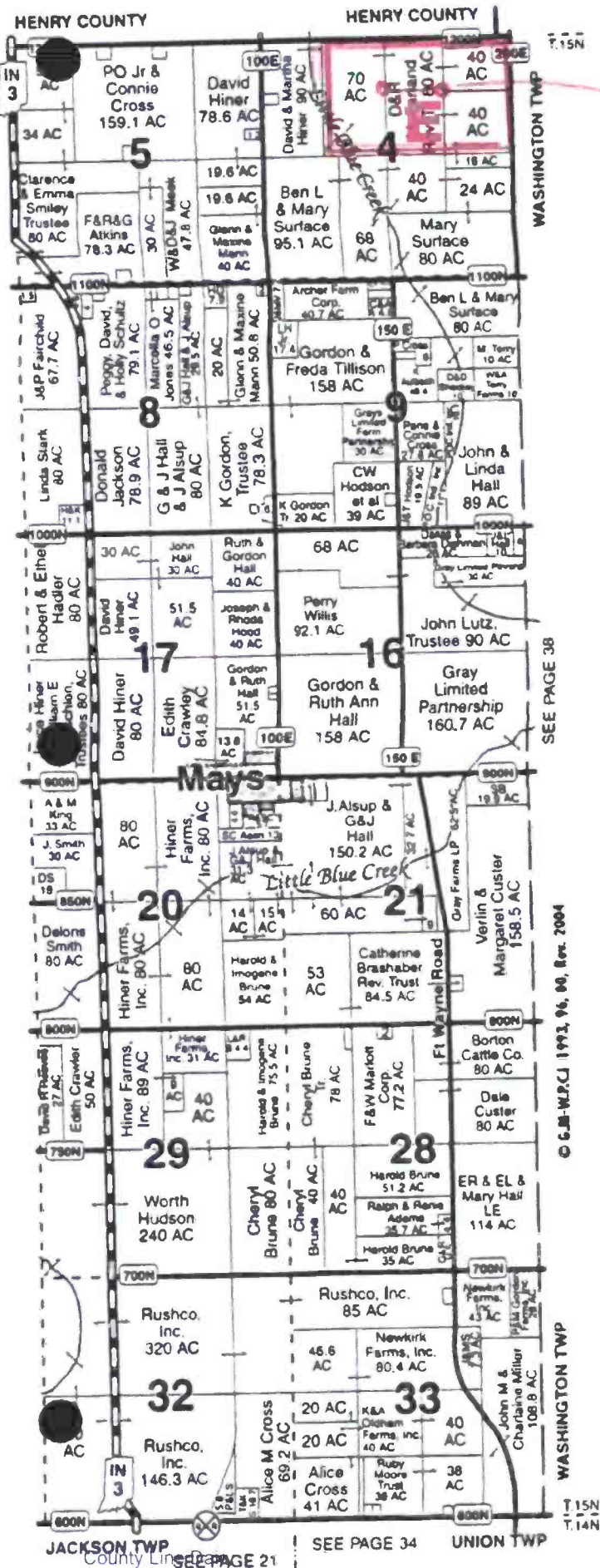


Title & Abstract

CENTER TWP

RUSH COUNTY, INDIANA T.15N-R.0E, 10E

SCALE OF MILES 1/4
SCALE OF FEET 5000



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CORRECTION REQUEST

This directory has been published as a county ownership reference guide. The data contained herein has been compiled from official city, state, and county public records. Constant property sales and transfers make it impossible for us to guarantee 100% accuracy: errors and omissions are inevitable. If you should notice an error in the Index of Owners or on a map, we would appreciate it if you would mail the correction to us on the coupon provided. We convey our sincere thanks to our county officials for their participation. Your county plat directory has been made possible with their cooperation and support.



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PLEASE PRINT

NAME _____ COUNTY _____
ADDRESS _____ CITY STATE ZIP _____
TOWNSHIP & RANGE SECTION AMT. OF ACREAGE

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254

CENTER TWP

SEE PAGE 19

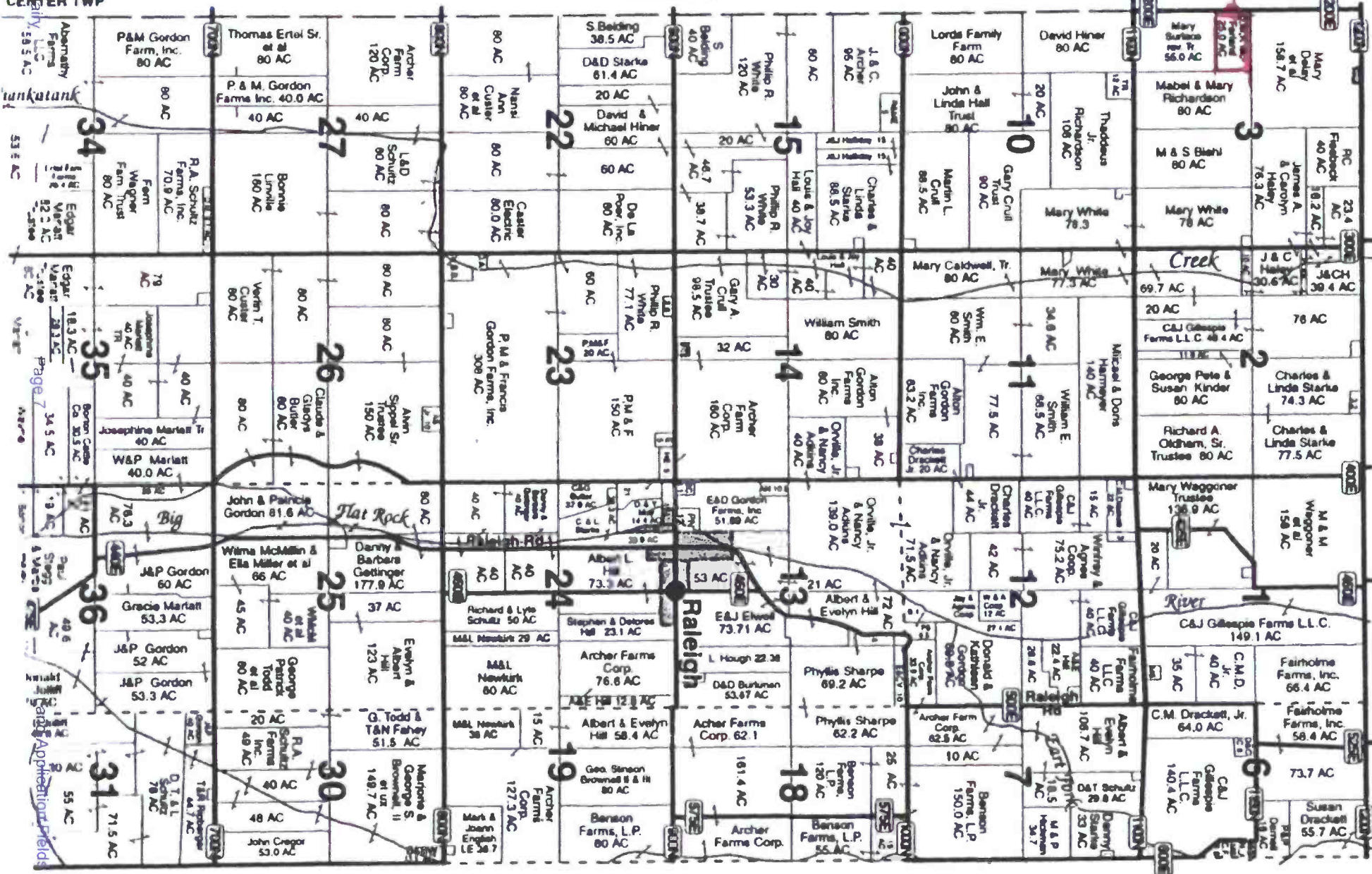
CENTER TWP

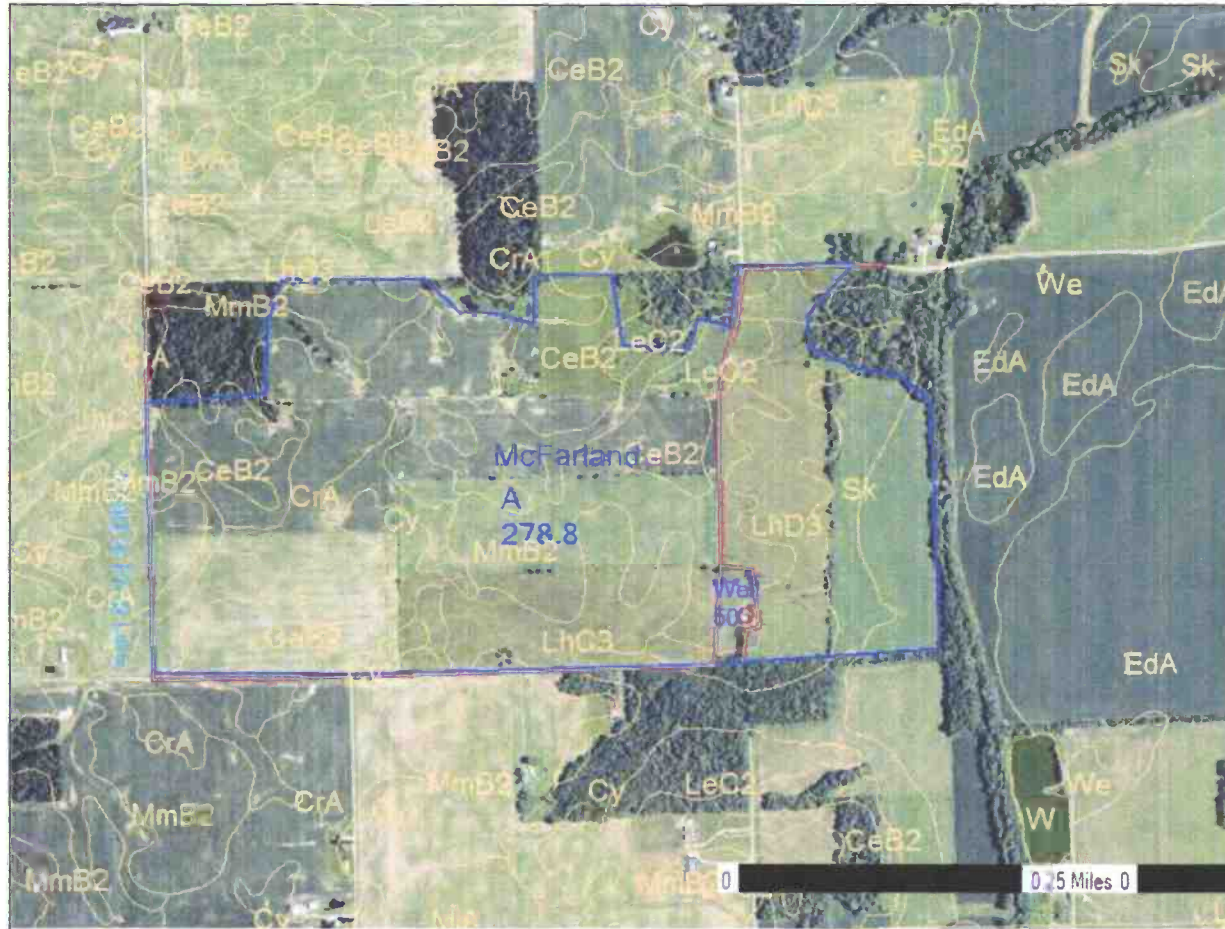
HENRY COUNTY

Washington Twp

R.10E
R.11E

HENRY COUNTY





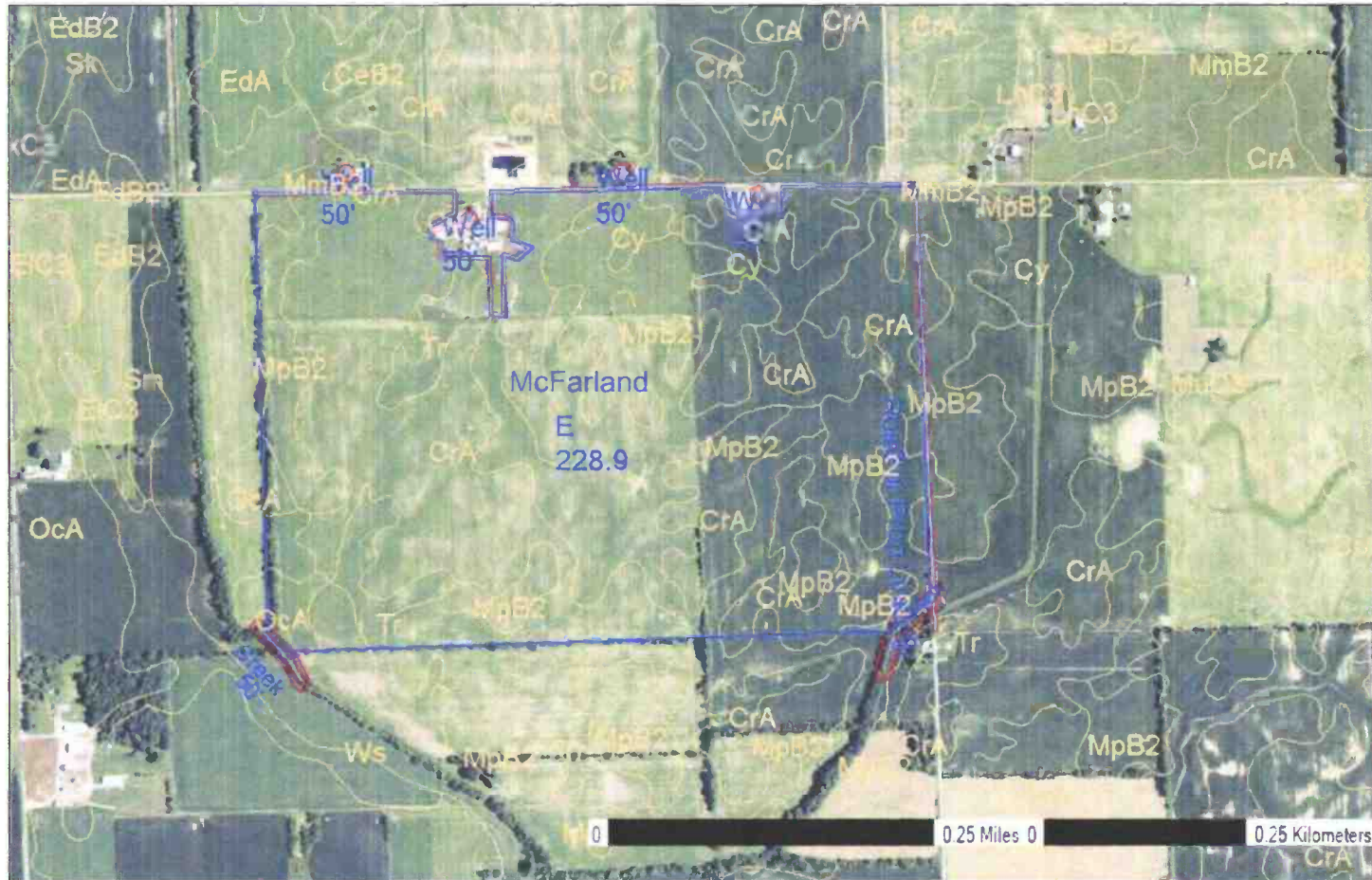
Milco_Dairy_II_A

- Road
- Subdiv
- Subdiv
- Subdiv
- Road or Prop Use
-

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Milco_Dairy_II_B_C
D



Milco_Dairy_II_E

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- Water**
- Outwash**
- Shade**
- Road or Prop Line**
- ↓**

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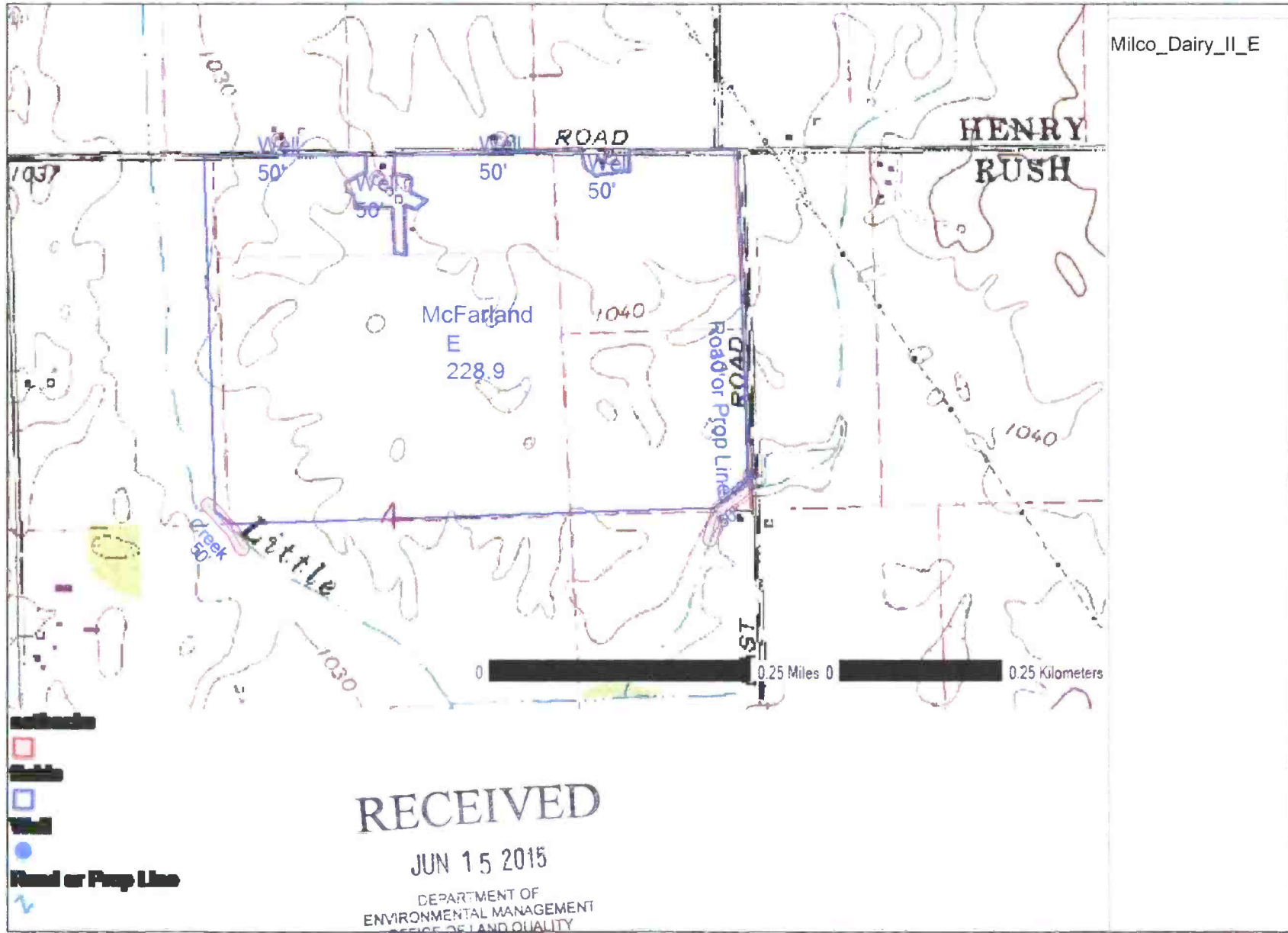
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PROJECT NO. 14-100
 DATE 12/6/14
 WEATHER cloudy/windy 40°
 INITIAL GWL @ 6' FT.
 DELAYED GWL @ 18" @ 1 HRS.
 CAVE-IN none
 DRILLER KS TECH
 SURFACE ELEV. existing
 LOCATION see sketch
 AUGER TYPE 4" Solidflight/Badger ATV

TEST BORING LOG # B-21

PROJECT Milco² Dairy
 CITY Rushville, IN
 CLIENT N.P.E.



SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						14" clayey topsoil under vegetation	TP	
						brown/gray/orange mottled silty sandy clay	CL	
5'					4+5+4			5
6'					Shelby Tube	brown medium coarse sand	SP	
						gray sandy clay with some gravel	CL	
10'					6+6+7			10
						gray sandy gravel	SP-GP	
						boring terminated (rock) at 12'		
								15
								20

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LOG REFORM 14-1 SOILTEST.GDT 12/9/14

PROJECT NO. 14-100
 DATE 12/6/14
 WEATHER cloudy/windy 40°
 INITIAL GWL @ 10' FT.
 DELAYED GWL @ 9' @ 1 HRS.
 CAVE-IN none
 DRILLER KS TECH _____
 SURFACE ELEV. existing
 LOCATION see sketch
 AUGER TYPE 4" Solidflight/Badger ATV

TEST BORING LOG # B-22

PROJECT Milco² Dairy
 CITY Rushville, IN
 CLIENT N.P.E.



SOIL TESTING
 8368 YOUNG RD., FT. WAYNE, IN 46835

SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						6"± topsoil under vegetation brown/gray/orange mottled silty sandy clay	TP CL	
5'					5+8+7	brown sandy clay with some gravel	CL	5
8'					Shelby Tube			
10'					6+6+7	gray sandy silt	ML	10
15'					5+7+8	gray sandy clay with some gravel	CL	15
						boring terminated @ 16'0"		

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20

PROJECT NO. 14-100
 DATE 12/6/14
 WEATHER cloudy/windy 40°
 INITIAL GWL @ 6'6" FT.
 DELAYED GWL @ 4'6" @ 1 HRS.
 CAVE-IN none
 DRILLER KS TECH
 SURFACE ELEV. existing
 LOCATION see sketch
 AUGER TYPE 4" Solidflight/Badger ATV

TEST BORING LOG # B-23

PROJECT Milco² Dairy
 CITY Rushville, IN
 CLIENT N.P.E.



SOIL TESTING
 8368 YOUNG RD. FT. WAYNE, IN 46835

SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						16"± clayey topsoil under vegetation	TP	
						brown/gray/orange mottled silty sandy clay	CL	
5'				Shelby Tube				5
						brown medium coarse sand	SP	
						brown sandy clay with some gravel	CL	
10'				10+12+12				10
						gray sandy clay with some gravel	CL	
15'				10+12+17				15
						boring terminated @ 16'0"		
								20

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PROJECT NO. 14-100
 DATE 12/6/14
 WEATHER cloudy/windy 40°
 INITIAL GWL @ 10' FT.
 DELAYED GWL @ 18" @ 1 HRS.
 CAVE-IN none
 DRILLER KS TECH

TEST BORING LOG # B-24



SOIL TESTING
 8368 YOUNG RD. FT. WAYNE, IN 46035

SURFACE ELEV. existing
 LOCATION see sketch
 AUGER TYPE 4" Solidflight/Badger ATV

PROJECT Milco² Dairy
 CITY Rushville, IN
 CLIENT N.P.E.

SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						18"± clayey topsoil under vegetation	TP	
						brown/gray/orange mottled silty sandy clay	CL	
						brown very sandy clay	CL	
5'					Shelby Tube			5
						brown sandy gravel	SP-GP	
10'					6+6+5			10
						boring terminated (rock) at 11'0"		
								15
								20

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PROJECT NO. 14-100

TEST BORING LOG # B-25

DATE 12/6/14

WEATHER cloudy/windy 40°

INITIAL GWL @ 10' FT.

DELAYED GWL @ 6' @ 1 HRS.

CAVE-IN none

DRILLER KS TECH

PROJECT Milco² Dairy

SURFACE ELEV. existing

CITY Rushville, IN

LOCATION see sketch

CLIENT N.P.E.

AUGER TYPE 4" Solidflight/Badger ATV


SOIL TESTING
 8368 YOUNG RD. FT. WAYNE, IN 46835

SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						6"± clayey topsoil under vegetation	TP	
						brown/gray/orange mottled silty sandy clay	CL	
5'					4+5+7	brown sandy clay with some gravel	CL	5
7.5'					Shelby Tube	brown medium coarse sand	SP	
10'					5+5+6	gray sandy silt	ML	10
15'					6+7+7	gray sandy clay with some gravel	CL	15
						boring terminated @ 16'0"		
<div style="text-align: center;"> RECEIVED JUN 15 2015 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT OFFICE OF LAND QUALITY </div>								
								20

PROJECT NO. 14-100
 DATE 12/6/14
 WEATHER cloudy/windy 40°
 INITIAL GWL @ 10' FT.
 DELAYED GWL @ 13' @ 1 HRS.
 CAVE-IN 12'
 DRILLER KS TECH

TEST BORING LOG # B-26



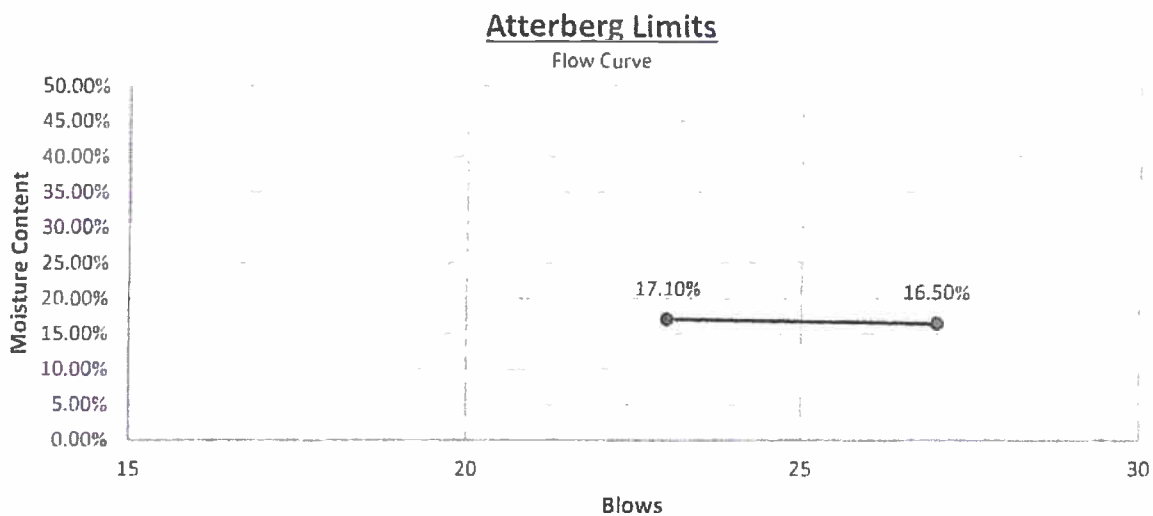
SOIL TESTING
 8368 YOUNG RD. FT. WAYNE, IN 46835

SURFACE ELEV. existing
 LOCATION see sketch
 AUGER TYPE 4" Solidflight/Badger ATV

PROJECT Milco² Dairy
 CITY Rushville, IN
 CLIENT N.P.E.

SAMPLE DEPTH	DRY DENSITY	% MOISTURE CONTENT	P.P.R. (T.S.F.)	TORVANE (T.S.F.)	BLOW COUNT	SOIL DESCRIPTION	USC	DEPTH
						4"± clayey topsoil under vegetation	TP	
						brown/gray/orange mottled silty sandy clay	CL	
5'					4+5+7			5
7'					Shelby Tube			
10'					5+6+6			10
15'					Heave			15
						brown/gray sandy silt with some sand veins	ML	
						boring terminated @ 16'0"		
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								20

Project:	Milco ²
Date:	Jan-15
Sample:	brown sandy clay with some gravel
Location:	#B-22 depth 8'



Liquid Limit:	16.80%
Plastic Limit:	11.40%
Plasticity Index:	5.4
P200 Content:	55.79%
Natural Moisture:	

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8368 Young Road Ft. Wayne, IN 46835
Phone: (260) 485-4637 Fax: (260) 492-2666

Geotechnical Soils Investigation - Concrete - Grout - Nuclear Compaction Testing

Blows	Moisture Density
27	16.50%
23	17.10%

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Phone: (260) 485-4637 Fax: (260) 492-2666

Geotechnical Soils Investigation - Concrete - Grout - Nuclear Compaction Testing

Project: Milco²
Date: Dec-14
Technician: K. Snyder



HYDRAULIC CONDUCTIVITY TEST REPORT TRIAxIAL CELL WITH BACK PRESSURE

Sample & Test Characteristics

Sample: brown sandy clay with some gravel
Sample Source: #B-22 Depth 8'
Sample Type: Shelby Tube
Length of Sample: 3.6" Diameter of Sample: 2.8"
Dry Weight P.C.F. : N/A Moisture Content: 16.00%

Confining Pressure: 4.0 PSI
Upper Cap Pressure: 38.0 PSI
Lower Cap Pressure: 40.0 PSI
Back Pressure Differential: 2.0 PSI
Degree of Saturation: >95%

Summary of Measurements

Measurements:

Actual Back Pressure PSI:

Flow into Sample cm

Flow out of Sample cm

Time in Seconds:

Average Temperature c.:

Correction Factor for Water Viscosity:

Hydraulic Conductivity cm/sec :

1	2	3	4
2	2	2	2
1.6	1.7	3.4	3.3
1.6	1.6	3.4	3.3
43,200	43,200	86,400	86,400
19	19	19	19
1.0	1.0	1.0	1.0
6.2×10^{-8}	6.4×10^{-8}	6.6×10^{-8}	6.4×10^{-8}

Average Hydraulic Conductivity cm/sec : 6.4×10^{-8}

Comments:

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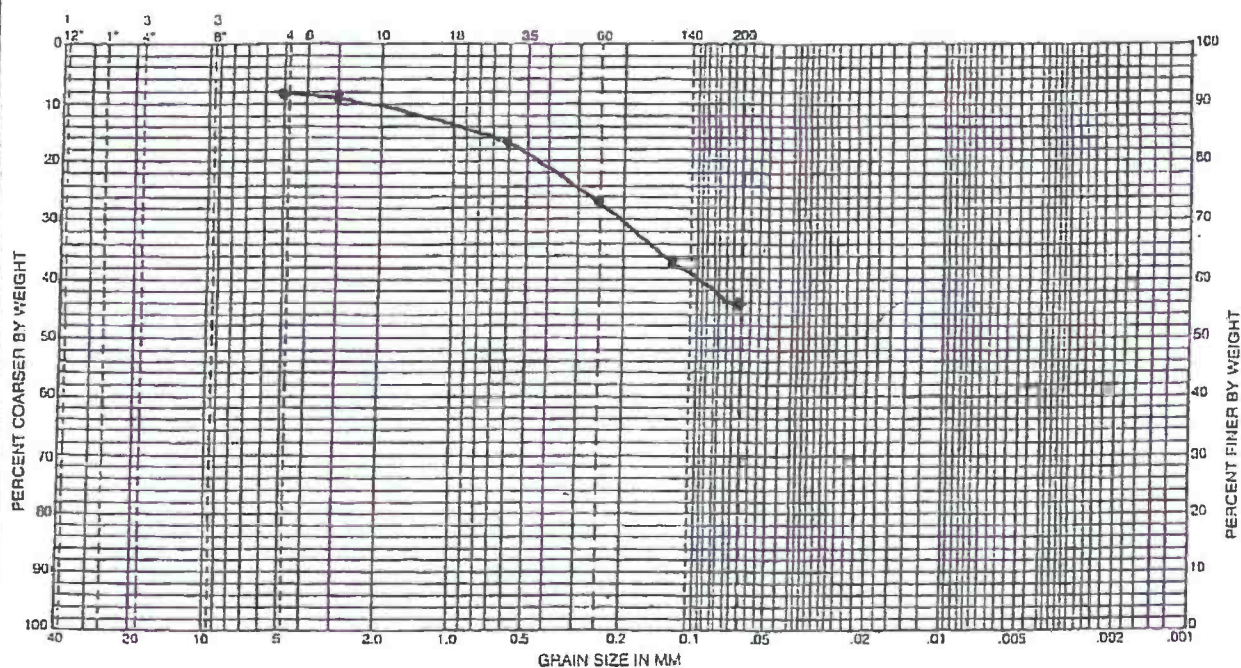
SIEVE ANALYSIS U.S. STANDARD SIEVES

Client: Milco² Dairy

Date: January 2015

Description of Sample: Brown sandy clay with some gravel 'CL'

Location: #B-22 Depth 8'



Measured in % Passing

Aggregate Size	R-200
#4	8.08
#8	8.24
#30	17.18
#60	27.28
#120	37.53
#200	44.21

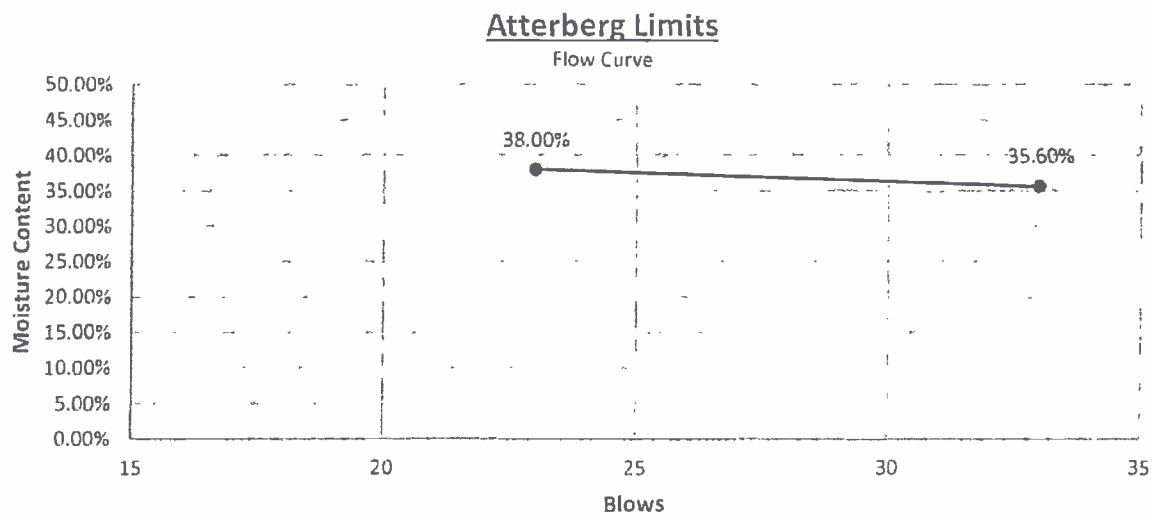
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8368 Young Road Ft. Wayne, IN 46835 (260) 485-4637 Fax (260) 492-2666
Geotechnical Soils Investigations-Concrete, Grout & Nuclear Compaction Testing

Project:	Milco ²
Date:	Jan-15
Sample:	mottled silty sandy clay
Location:	#B-23 depth 4'



Liquid Limit:	37.70%
Plastic Limit:	20.50%
Plasticity Index:	17.2
P200 Content:	90.74%
Natural Moisture:	

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Phone: (260) 485-4637 Fax: (260) 492-2666

Geotechnical Soils Investigation - Concrete - Grout - Nuclear Compaction Testing

Blows	Moisture Density
33	35.60%
23	38.00%

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Phone: (260) 485-4637 Fax: (260) 492-2666

Geotechnical Soils Investigation - Concrete - Grout - Nuclear Compaction Testing

Project: Milco²
Date: Dec-14
Technician: K. Snyder



HYDRAULIC CONDUCTIVITY TEST REPORT TRIAXIAL CELL WITH BACK PRESSURE

Sample & Test Characteristics

Sample: mottled silty sandy clay (brown/gray/orange)
Sample Source: #B-23 Depth 4'
Sample Type: Shelby Tube
Length of Sample: 3.5" Diameter of Sample: 2.8"
Dry Weight P.C.F.: N/A Moisture Content: 22.10%

Confining Pressure: 4.1 PSI
Upper Cap Pressure: 38.0 PSI
Lower Cap Pressure: 40.0 PSI
Back Pressure Differential: 2.0 PSI
Degree of Saturation: >95%

Summary of Measurements

Measurements:

Actual Back Pressure PSI:

Flow into Sample cm

Flow out of Sample cm

Time in Seconds:

Average Temperature c.:

Correction Factor for Water Viscosity:

Hydraulic Conductivity cm/sec :

1	2	3	4
2	2	2	2
0.6	0.6	1.2	1.1
0.5	0.6	1.2	0.1
43,200	43,200	86,400	86,400
19	19	19	19
1.0	1.0	1.0	1.0
2.1×10^{-8}	2.3×10^{-8}	2.3×10^{-8}	2.1×10^{-8}

Average Hydraulic Conductivity cm/sec : 2.2×10^{-8}

Comments:

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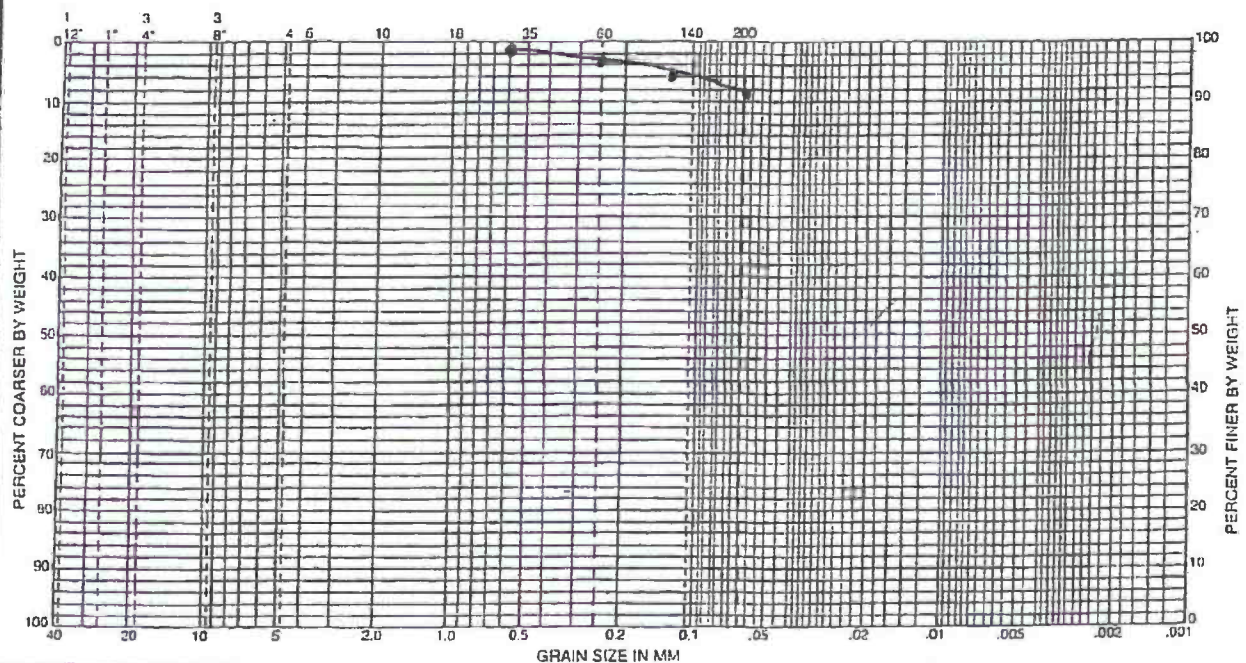
SIEVE ANALYSIS U.S. STANDARD SIEVES

Client: Milco² Dairy

Date: January 2015

Description of Sample: Mottled silty sandy clay (brown/gray/orange)

Location: #B-23 Depth 4'



Measured in % Passing

Aggregate Size	R-200
#4	0
#8	0
#30	1.50
#60	3.13
#120	6.10
#200	9.26

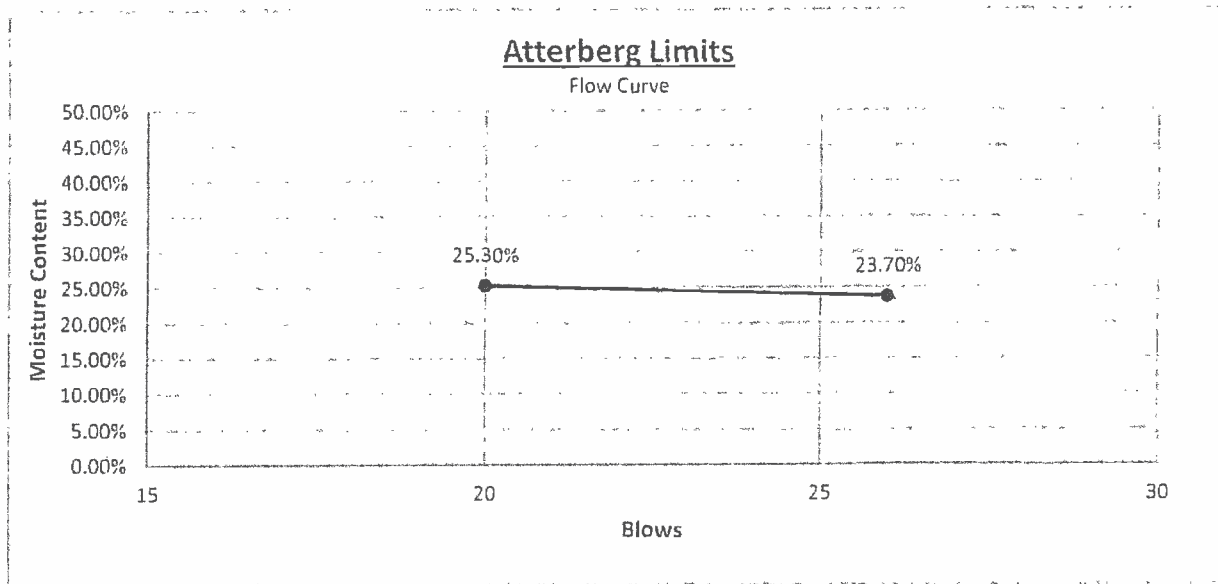
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8368 Young Road Ft. Wayne, IN 46835 (260) 485-4637 Fax (260) 492-2666
Geotechnical Soils Investigations-Concrete, Grout & Nuclear Compaction Testing

Project:	Milco ²
Date:	Jan-15
Sample:	brown sandy clay with some gravel
Location:	#B-24 depth 5'



Liquid Limit:	24.20%
Plastic Limit:	15.10%
Plasticity Index:	9.1
P200 Content:	61.64%
Natural Moisture:	

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Geotechnical Soils Investigation - Concrete - Grout - Nuclear Compaction Testing

Blows	Moisture Density
26	23.70%
20	25.30%

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Project: Milco²
Date: Dec-14
Technician: K. Snyder



HYDRAULIC CONDUCTIVITY TEST REPORT TRIAxIAL CELL WITH BACK PRESSURE

Sample & Test Characteristics

Sample: brown sandy clay with some gravel
Sample Source: #B-24 Depth 5'
Sample Type: Shelby Tube
Length of Sample: 3.5" Diameter of Sample: 2.8"
Dry Weight P.C.F. : N/A Moisture Content: 16.80%

Confining Pressure: 4.0 PSI
Upper Cap Pressure: 40.0 PSI
Lower Cap Pressure: 42.0 PSI
Back Pressure Differential: 2.0 PSI
Degree of Saturation: >95%

Summary of Measurements

Measurements:	1	2	3	4
Actual Back Pressure PSI:	2	2	2	2
Flow into Sample cm	0.8	0.9	1.7	1.7
Flow out of Sample cm	0.8	0.9	1.7	1.7
Time in Seconds:	43,200	43,200	86,400	86,400
Average Temperature c.:	19	19	19	19
Correction Factor for Water Viscosity:	1.0	1.0	1.0	1.0
Hydraulic Conductivity cm/sec :	3.0×10^{-8}	3.4×10^{-8}	3.2×10^{-8}	3.2×10^{-8}

Average Hydraulic Conductivity cm/sec : 3.2×10^{-8}

Comments:

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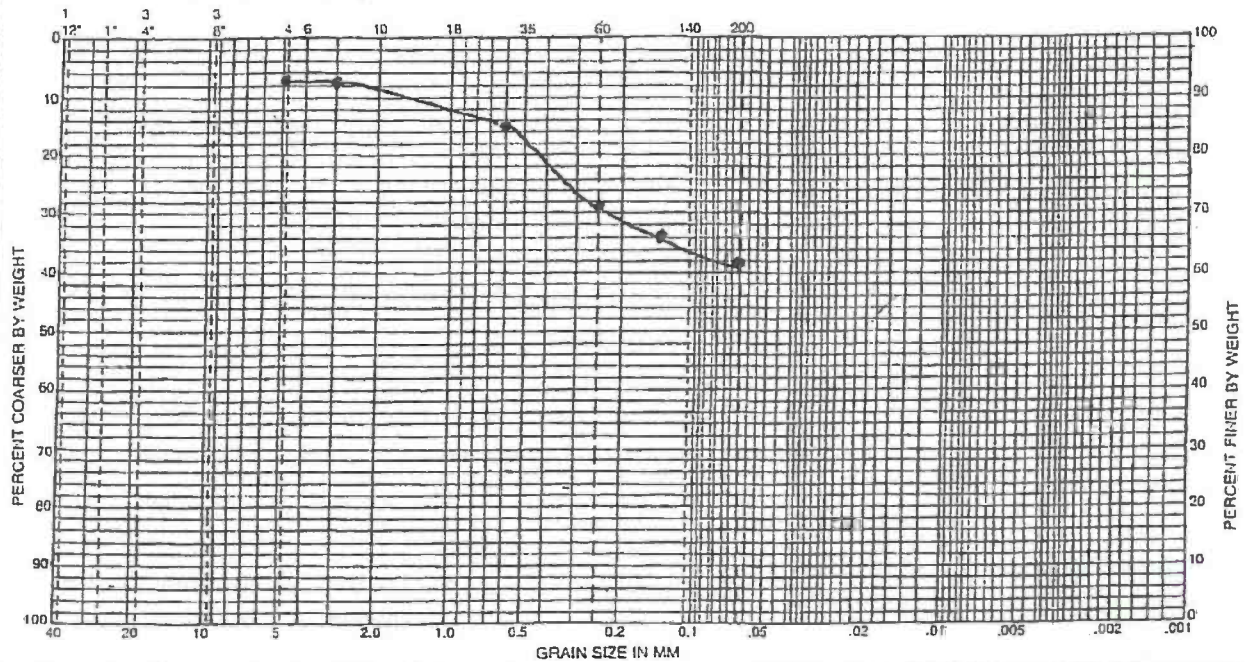
SIEVE ANALYSIS U.S. STANDARD SIEVES

Client: Milco² Dairy

Date: January 2015

Description of Sample: Brown silty sandy clay with some gravel

Location: #B-24 Depth 5'



Measured in % Passing

Aggregate Size	R-200
#4	7.90
#8	7.92
#30	15.37
#60	29.36
#120	34.43
#200	38.36

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Geotechnical Soils Investigations-Concrete, Grout & Nuclear Compaction Testing

September 30, 2013

Milco Dairy
9305 S. County Road 275E
Lewisville, IN 47352

Attention: Mr. Nico Niessen

Reference: Geotechnical Exploration and Engineering Report
Milco Dairy Expansion
East County Line Road 1200N
Lewisville, IN - Rush County
CTL Project No.: 13050048WAP

Mr. Niessen:

CTL Engineering, Inc. has completed the geotechnical exploration for the above referenced structure. The purpose of this investigation was to evaluate the subsurface conditions and provide recommendations and soil parameters for the design and construction of the proposed Freestall Barn, Parlor, Bunker, Run-Off Lagoon and Manure Lagoon. Various empirical correlations have been made in analyzing the subsurface soils of the site. These correlations were made using generally accepted geotechnical engineering practices and published documents.

Thank you for the opportunity to be of service to you on this project. If you have any questions, please contact our office.

Respectfully Submitted
CTL Engineering, Inc.



Frederick L. Schoen, P.E.
Project Engineer

FLS:fls

1cc. hardcopy to addressee
1cc. Homan, Inc., - Attn. Al Unrast
1cc. Ag Environmental Consulting – Attn. Brian Daggy

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GEOTECHNICAL ENGINEERING REPORT

MILCO DAIRY EXPANSION

**EAST COUNTY LINE ROAD 1200N
LEWISVILLE, IN – RUSH COUNTY**

CTL PROJECT NO: 13050048WAP

PREPARED FOR:

**MILCO DAIRY
9305 S. COUNTY ROAD 275E
LEWISVILLE, IN 47352**

PREPARED BY:

**CTL ENGINEERING, INC.
102 COMMERCE DRIVE
P.O. BOX 44
WAPAKONETA, OHIO 45895
www.ctleng.com**

September 30, 2013

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APPENDIX D	SOIL SURVEY DOCUMENTS
APPENDIX E	IDEM DESIGN AND CONSTRUCTION REQUIREMENTS

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Subsurface Information

I. PROJECT LOCATION AND DESCRIPTION

The purpose of this investigation is for the design and construction of a new dairy complex located in Rush County, Indiana. The complex is understood to include:

Freestall Barn

- 217 ft.-8 in. by 403 ft.-7 in.
- 1,008 Beds @ c/c Stalls (12 ft. Bays)

Milking Parlor

- 149 ft. by 95 ft.-8 in.

Bunker

- 201 ft. by 200 ft.
- 8 ft. to 16 ft. high concrete walls
- Concrete apron and sand storage pad

Run-Off Earthen Storage Lagoon

- 150 ft. by 150 ft.
- Approximately 1 Million gallon storage capacity
- Approximately 10 feet to 15 feet deep

Manure Earthen Storage Lagoon

- 356 ft. by 356 ft.
- Approximately 14 Million gallon storage capacity
- Approximately 20 feet to 25 feet deep
- 12-inch thick concrete overflow wall constructed within lagoon

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II. SUBSURFACE EXPLORATION

Twenty (20) soil test borings, B-01-13 through B-20-13, were drilled August 21 to August 24, 2013. Borings were drilled to depths of 20 feet to 30 feet below existing surface grades, as indicated in *Table 1*. The test borings were drilled using an All-Terrain Vehicle (ATV) mounted rotary drill rig and utilized hollow-stem augers (HSA).

Table 1 – Soil Boring Depths

Borings	Purpose	Boring Depths (ft)
B-01-13 through B-06-13	Freestall Barn	20.0
B-07-13 and B-08-13	Parlor	20.0
B-09-13 through B-12-13	Bunkers	20.0
B-13-13 and B-14-13	Run-Off Lagoon	20.0
B-15-13 through B-20-13	Manure Lagoon	30.0

Standard Penetration Tests (SPT) were conducted during drilling using a 140-pound automatic hammer falling 30 inches to drive a 2.0-inch O.D. split barrel sampler for 18 inches. Standard penetration tests were performed at 2.5-foot or 5-foot intervals as determined by geotechnical sampling personnel. Automatic hammers are more efficient than the older style manual hammers. Therefore, SPT results were adjusted to obtain corrected N-values (N_{60} -values) using an automatic hammer to manual hammer energy ratio of 84 percent. This correction is typically applied in attempts to standardize the SPT N-values to that of generally accepted geotechnical engineering practices and published documents.

Soil samples obtained from the drilling operation were preserved in glass jars, visually classified in the field and laboratory, and tested for natural moisture content. Representative soil samples were subjected to laboratory testing including grain size analysis, Atterberg limits, and hand penetrometer.

Furthermore, an "undisturbed" Shelby Tube was obtained during our field investigation. This sample was subjected to Hydraulic Conductivity (permeability) testing.

Drilling, sampling, and field testing have been performed according to standard geotechnical engineering practices and current ASTM procedures. Laboratory testing was performed in accredited laboratories by trained technicians. Results from field and laboratory tests are shown on the enclosed boring records and soil profile sheets found in the appendices.

Ground surface elevations at each boring location were referenced to the centerline of County Line Road N 1200E at its entrance into the project site. This arbitrary benchmark was assumed as elevation 100.00 feet.

III. FINDINGS

A. Site Geology and Soil Physiography

Rush and Henry Counties lies within the Central Till Plain physiographic region of Indiana, which is characterized by relatively flat to gently rolling topography. It has been subject to several glacial events in its history, most recently, the Wisconsin ice sheet.

Surface soils across the project include Celina silt loam with 2 to 6 percent slopes, Crosby silt loam with 0 to 3 percent slopes, Cyclone silty clay loam, Miamian silt loam with 2 to 6 percent slopes, eroded, and Treaty silty clay loam.

The regional area includes deposits of glacial till, lacustrine soils, kames, and outwash. Most of the surficial glacial deposits of Rush County are in the form of ground moraines, including the project site. Ground moraines are extensive, broad, flat-surfaced deposits of till. The till was deposited discontinuously by ice

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advancing over older glacial deposits or bedrock and consist of varying percentages of clay, silt, sand, and gravel.

The site is located overlying the Maquoketa Group of Ordovician age bedrock. This rock type is sedimentary rock consisting of shale with limestone. Bedrock is expected to be encountered at depths greater than 200± feet and the area is not known to exhibit karst or underground mine activities.

B. Observations

The parcel of land intended for the new dairy is currently an agricultural field that supports an alfalfa crop. The parcel is understood to be approximately 40 acres in size and is located on the south side of the road. Topography across the field is gently rolling with several shallow drainage swales and depressions cutting across the surface of the site. At the time of our exploration, there were no standing water, but as indicated by the type of vegetation in isolated locations and the shallow tire depressions of the farm equipment used to harvest the crop, several areas are suspected to retain water during heavier rain events.

C. Subsurface Conditions

1. Soils

Surface soils in borings drilled exhibited approximately 8 inches of topsoil and tilled soil.

Below the topsoil, most borings encountered a 3 to 6 feet thick layer of lean clay (CL) which exhibited corrected Standard Penetration Test (SPT) N_{60} -values of 7 to 13 blows per foot (bpf), with natural moisture contents of 16 to 25 percent.

Brown sandy lean clay (CL) and sandy silty clay (CL-ML) glacial till deposits were encountered below the upper lean clays. These denser soils exhibited N_{60} -values ranging from 6 to 48 bpf, with natural moisture content values of 8 to 18 percent. They were found to extend to depths of 8 to 14 feet below existing surface grades.

Gray sandy lean clay was encountered below the brown cohesive soils to bottom of boring depths of 20 or 30 feet. These soils exhibited N_{60} -values of 8 to 41 bpf, with natural moisture contents of 7 to 20 percent.

In several of the borings, thin sand and non-plastic silt seams and layers were encountered below elevation 93.0 feet. These noncohesive soils exhibited N_{60} -values of 11 to 28 bpf and often contained some degree to water.

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Rock was not encountered in borings drilled at this site location.

2. Groundwater

Groundwater was encountered in thirteen of the twenty borings drilled. It should be noted that fluctuations in groundwater levels should be expected over time due to variations in precipitation. Static groundwater levels can only be determined through observations made in cased holes over a long period of time. However, borings indicate that once encountering the various sand layers and seams below elevation 93.0 feet, there is an increased chance of encountering groundwater. In observing water levels in the boreholes 24-hours after completion of drilling, water was found at depths of 6.5 to 16.1 feet below existing grades. This may be perceived as being the piezometric water level of the site and the overlying clay soils is acting as a confining barrier for the groundwater found in the various sand seams. Groundwater levels typically are the highest during the spring months.

Table 2 – Groundwater Readings

Boring	Groundwater Levels (ft.)				Bore Hole Cave-in Depth (Feet)
	When Encountered		Delayed Reading at 24-Hrs.		
	Depth	Elev.	Depth	Elev.	
B-01-13	Dry	--	Dry	--	18.0
B-02-13	Dry	--	Dry	--	18.5
B-03-13	Dry	--	Dry	--	18.3
B-04-13	6.0	93.3	6.5	92.8	18.0
B-05-13	Dry	--	9.0	90.0	18.0
B-06-13	Dry	--	Dry	--	17.7
B-07-13	Dry	--	16.0	87.5	18.0
B-08-13	14.0	86.8	10.0	90.8	18.1
B-09-13	Dry	--	Dry	--	18.2
B-10-13	Dry	--	9.5	91.5	18.3
B-11-13	Dry	--	Dry	--	18.0
B-12-13	7.0	92.6	9.0	90.6	18.0
B-13-13	Dry	--	Dry	--	17.5
B-14-13	Dry	--	15.2	81.7	18.0
B-15-13	15.0	84.8	7.7	92.1	10.0
B-16-13	8.0	90.8	8.0	90.8	27.5
B-17-13	24.7	75.3	9.3	90.7	26.5
B-18-13	22.0	76.5	14.0	84.5	22.0
B-19-13	17.0	81.2	9.7	88.5	27.0
B-20-13	Dry	--	16.1	83.9	27.5

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3. Laboratory Test Data

Selected representative samples of subsurface soils were subjected to Grain-Size Distribution, Atterberg Limits, and Hydraulic Conductivity tests. The laboratory test results are tabulated below.

Table 3 – Laboratory Grain-Size Distribution and Atterberg Limits

Boring	Sample	Depth	USCS	Liquid Limit	Plasticity Index	Percent Fines
B-06-13	SS-1	1.0 to 2.5	CL	43	25	97
B-09-13	SS-2	3.5 to 5.0	CL	24	10	58
B-06-13	BS-3	6.0 to 7.5	CL-ML	19	6	56
B-17-13	SS-6	18.5 to 20.0	CL	22	10	59

Table 4 – Laboratory Hydraulic Conductivity

Boring	Sample	Depth (ft.)	USCS	Hydraulic Conductivity (cm/sec.)
B-17-13	ST-1	15.0 to 17.0	CL	5.5×10^{-7}
B-17-13	ST-2	20.0 to 22.0	CL	--

IV. DISCUSSION

The site is considered suitable for construction of the proposed buildings and lagoon cells. Surface grades range from elevation 103.5 to 96.9 feet at boring locations. It is unknown at what finish floor elevation the proposed buildings will be at, but it has been assumed that finish floor elevation will be at or near elevation 100.00 feet. At these elevations the buildings will be supported by lean clay, sandy silty clay, or newly-placed engineered fills. Near surface soils are cohesive. Depending upon time of construction and seasonal amount of precipitation, near surface soils may exhibit unstable conditions during compaction and proofrolling operations. Soils, such as those found on-site, are likely unstable when moisture contents exceed the soil's Plastic Limit values. Surface soils at several locations were moist, exhibited moderately low N-values, and natural moisture contents greater than the soils' Plastic Limit value. These are indicators that the surface soils may be unstable and will require soil modification or stabilization. Air-drying of these soils may be difficult to achieve, particularly during winter months and the wet season.

The exact elevations of the bottom of the lagoons are unknown. It is assumed that the bottom of the Run-Off lagoon will be near elevation 90.0 feet and the bottom of the Manure Lagoon to be near elevation 80.0 feet. At these elevations, the native soils encountered in the borings drilled in the vicinity of the lagoons exhibited primarily cohesive sandy lean clays and silty clay glacial till deposits. The borings for the manure lagoon also exhibited sand layers between elevations 93.0 and 73.0 feet. The cohesive soils should be adequate for construction of lagoons, but because of the potential of

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encountering thin sand seams/layers and vertical fissures within the dense glacial till deposits, it is recommended that the lagoons be constructed with a clay liner so designed finish grades form a uniform, homogeneous, low permeability layer of soil.

Typical soils suitable for embankment and liners are materials with Percentage of Material passing through #200 sieve exceeding 40% with a Plasticity Index value greater than 25. Only a portion of the on-site soils meet these recommended values. Furthermore, hydraulic conductivity (permeability) testing of the undisturbed soils was found to exhibit a permeability of 5.5×10^{-7} cm/sec.

Based on the hydraulic conductivity test result of the on-site silty clays, existing native clayey soils may be used for embankment and liner construction, provided it is properly compacted with moisture content values greater (preferably +2%) than OMC values. Fill should also be uniformly mixed with all clay lumps being broken up and layers not exceeding 6 to 8 inches in thickness, as discussed below. Surface of each layer placed should be scarified to ensure proper bonding. Further, the fill should be kept moist and not allowed to dry. Drying may result in fissures and/or discontinuities that will compromise the performance of the liner.

IDEM Design and Construction Requirements for Earthen Liquid and Solid Manure Storage Structures and Lagoons

Per the "Guidance Manual for Indiana's Confined Feeding Program", dated June 15, 2012, page 27 (found in *Appendix E* of this report) "all earthen liquid manure storage structures must be designed to not exceed a seepage rate of 1/16 cubic inches per square inch per day". It is felt that the geologic site conditions for this site meet these criteria based upon the following reasons.

- An aquifer usually is associated with non-cohesive sandy/gravelly soils or semi-porous to porous rock deposits. Plastic silts and clays are low permeability soils and typically a poor source of groundwater for water wells; therefore, not considered an aquifer. Soils encountered during of subsurface investigation were brown changing to gray silt and clay soils to bottom of boring depths, which extended to elevations near 65.0 feet, which is more than 5 feet below the deepest known manure storage facility. These cohesive soils were classified as CL and CL-ML soils per the Unified Soils Classification System (USCS) while having 56 to 97 percent of the soil particles passing the No. 200 sieve as indicated by laboratory testing of soils samples.
- The "undisturbed" Shelby Tube sample tested for permeability exhibited a permeability rate of 5.5×10^{-7} cm/sec. This equates to a seepage rate of 0.3/16 cubic inches per square inch per day or approximately 1/64 cubic inches per square inch per day. These values meet and exceed the minimum requirement noted by IDEM of 1.8×10^{-6} cm/sec (1/16 in.³/in.²/day).

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Surface drainage across the site will be altered with the construction of the proposed building and pavements. It is recommended that all surface water run-off be collected or directed away from buildings and pavements into storm sewers or drainage ditches so that subgrade soils under pavements and slabs do not become saturated and loss their strength.

V. ANALYSIS AND RECOMMENDATIONS

Excavation to depths represented by the test borings can be accomplished using conventional earth moving equipment. Excavation sidewalls should be sloped to meet OSHA standards or shored to protect workmen. Rock is not expected to be encountered in excavations.

Based upon preceding considerations as well as subsurface information obtained from the field and laboratory testing, following recommendations are provided.

A. Site Preparation and Earthwork

1. All topsoil and vegetative matter encountered within the proposed construction limits should be removed from the site. Topsoil may be stockpiled separately for use in future landscaping areas.
2. Any underground utilities located within the construction limits should be removed or relocated. Existing field drainage tile, if any, should be relocated from under proposed structures and around proposed lagoons.
3. During earthwork operations, care should be taken to provide adequate drainage on the surface of exposed soils. Absorption of heavy rainfall, accumulations of water and heavy construction traffic may result in softening of these soils, hence, severely weakening the strength of the subgrade soils.
4. Groundwater is not likely to occur in shallow excavations above elevation 93.0 feet. As in any naturally deposited soil, trapped seepage water may be found within isolated sand seams across the site. Temporary dewatering in areas of encountered water may be accomplished by placing localized sumps within the excavation or cut-off trenches and sumps beyond the excavation.
5. Temporary excavations in excess of 4 feet in depth should be sloped, benched or shored in accordance with OSHA regulations. Excavation sidewalls for any underground utility placements or incidental retaining walls, should be laid back at a slope rate no steeper than ¾:1 (Horizontal to Vertical). Excavation sidewalls may exhibit cave-in particularly if sand or granular soils or soft, loose soils are encountered. In excavations that are 20 feet or less in depth, OSHA regulations allow ¾:1 slope rates in

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soils classified as Type A soils, 1:1 slopes in Type B soils, and 1.5:1 in Type C soils. The width of trenches deeper than 4.0 feet can be reduced with the use of vertical trench walls and a support or shield system as specified in OSHA Standard 1926, Subpart P, App B. All excavation sidewalls should be observed and approved during construction by the Geotechnical Engineer.

6. Following acceptance of the exposed surfaces, all fill materials required to raise the grade should consist of clean, on-site, inorganic, non-frozen soils. Fill materials for building support should have a Liquid Limit less than 40, a Plasticity Index less than 20, a standard maximum dry density of at least 100 pcf, a maximum particle size of 3 inches, and less than 3 percent by weight organic matter. Additional acceptable fill materials may consist of imported crushed limestone, sand or gravel. Topsoil, frozen and/or organically contaminated soils are not considered suitable for use as fill. All fill materials should be observed, tested and approved by the Soils Engineer. Material for pipe bedding, haunches and pipe embedment of proposed utility lines may consist of natural sand and gravel or other approved material designated by the project's design team or local authority. Corrosive clays and open-graded crushed aggregate are not recommended for ductile iron pipe.
7. Engineered fill should be placed in layers not to exceed 8 inches in loose thickness, with each layer compacted to 98 percent of the maximum dry density as determined by ASTM D-698 Standard Proctor method (AASHTO T-99) and $\pm 3\%$ of its optimum moisture content in structural or pavement areas, or as otherwise directed by the Soils Engineer.
8. Fill placement should extend beyond the limits of the proposed buildings or paved areas a minimum horizontal distance equal to the height of fill or 5 feet, whichever is greater. All exposed soil slopes should be no steeper than 2.5:1 H:V and be vegetated to prevent erosion. Surface runoff and drainage should be design to limit erosion of surface grades. Rock channels or similar items are recommended in areas of expected high volume runoff.

B. Foundation Support

1. The proposed buildings may be supported onto isolated column footings and/or continuous wall footings constructed into native soils or newly placed engineered fill. All footing bearing surfaces should be observed and approved by the Soils Engineer.

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2. Shallow foundation units may be proportioned using a net allowable bearing capacity of 2,500 pounds per square feet (psf). This bearing value applies to the total of all design loads. In the event that soft conditions are encountered at the footing bearing level, the soft soils should be excavated from below the footing the entire width of the footing. Lean concrete may be used to backfill the excavation up to the proposed footing bearing level.
3. Minimum widths for individual columns and continuous wall footings should be 24 and 16 inches, respectively. Minimum widths are considered advisable to provide a margin of safety against local or punching shear failure.
4. Exterior footings should be constructed at a minimum depth of 3 feet below the lowest adjacent exterior grade to offset the effects of frost penetration. Interior footings in areas of controlled temperature may be constructed at shallower depths below the floor slab provided that the soils exhibit sufficient soil bearing capacity.
5. Settlement of footings supported as recommended may vary across the site due to variations in the soil composition, depth of fill, void ratio and loading. However, it is estimated that total and differential settlements are considered to be within tolerable limits.

C. Floor Slab Support

1. The building floor slabs should be supported directly on a base course of approved granular material placed on top of approved native soils or newly placed engineered fill.
2. The granular base should be a minimum of 6 inches in thickness to provide support and to act as a capillary moisture break.
3. Portions of the floor slab subgrade will likely consist of newly placed engineered fill. Assuming any proposed fill materials required to raise grades are consistent with existing soils, a Modulus of Subgrade Reaction value of 100 pci may be used in the evaluation of subgrade soils.

D. Corrosion Protection

On-site surficial soils encountered in the test borings are described as having moderate to high potential for corrosion of buried steel, as noted in the *Soil Features section of the Henry and Rush Counties Soil Survey* attached as *Appendix D* of this report. A corrosion engineer specializing in protection of below grade metal structures should be consulted to design a corrosion protection system for any permanent metal structural components.

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E. Below Grade Wall Support

1. Temporary shoring/bracing and below grade walls may be designed using the parameters tabulated below. Anticipated loading adjacent to walls and shoring such as floor slab, vehicular loading, soil stockpiles, existing structures, etc. should be included in the design of the walls and shoring.
2. Groundwater is not likely to occur in shallow excavations above elevation 93.0 feet. Seepage water may be trapped in granular soil layers and sand seams, depending upon time of construction and amount of precipitation. Temporary dewatering in areas of seepage water may be accomplished by placing localized sumps within the excavation or in sumps beyond the excavation.

Parameters	Elevation (feet)			
	Cohesive Fill *	Granular Fill **	Above Elevation 90.0 feet	Below Elevation 90.0 feet
Cohesion, psf	400	0	400	400
Total Unit Weight, pcf	125	135	128	135
Angle of Internal Friction, Deg.	20	35	22	20
Soil/Concrete Friction Angle, Deg.	13	23	15	13
At Rest Pressure Coefficient, Ko	0.66	0.43	0.63	0.66
Active Pressure Coefficient, Ka	0.49	0.27	0.45	0.49
Passive Pressure Coefficient, Kp***	2.04	3.69	2.20	2.04
Undrained Shear Strength, psf	2,000	N/A	1,250	3,000

* These values assume that a major portion of the engineered fill will consist of near surface clay and silt soils meeting the recommendations noted in preceding paragraphs.

** These values assume that a granular soil such as bank run sand and gravel with less than 10 percent passing the no. 200 sieve is used.

*** Passive pressure in the upper 3.0 feet should be neglected.

3. Backfill immediately behind walls should consist of free draining granular material. The backfill should be compacted using compaction techniques and equipment approved by the Soils Engineer. Perforated PVC or HDPE pipe drains should be installed along the base of the walls to prevent the accumulation of water which would increase lateral loads or below grade walls must be designed to include the increased lateral loads from subsurface water pressures.
4. Based upon information obtained from soil borings, conventional earth-

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moving equipment may be used to excavate soils.

F. Lagoon Embankment Construction

1. Subsequent to site clearing and prior to any fill placement, the exposed surface should be scarified to a depth of at least 12 inches and re-compacted to a density not less than 95% of the maximum dry density value and with moisture content values between 0 and 4 % greater than the Optimum Moisture Content as determined by Standard Proctor Test (ASTM D-698) method. Soft or loose soils, if encountered, should be disked, dried and re-compacted, or undercut and replaced with compacted engineered fill, or otherwise determined by the Soils Engineer.
2. Engineered fill material required to raise the grade and/or create the embankments may consist of clean, on-site, non-organic, non-frozen excavated clayey soils, provided that they are observed and approved by the Soils Engineer. Borrow fill, if required, may consist of silty-clayey soils meeting the requirements noted in *section V.A.6* of this report. Topsoil, frozen and/or organically contaminated soils are not considered suitable for use as fill. All fill materials should be observed and approved by the Soils Engineer.
3. The engineered fill should be placed in layers not to exceed 8 inches in loose thickness, with each layer compacted to 95 percent of the maximum dry density with moisture content values between 0 and 4 % greater than the Optimum Moisture Content as determined by ASTM D-698 standard method (AASHTO T-99), or as otherwise directed by the Soils Engineer. The surface of each lift and the base should be scratched to form a bond with the next layer.
4. Excavations within the soil overburden may be accomplished using conventional equipment.
5. Permanently exposed outboard slopes should be laid back at a rate not exceeding 3:1 (Horizontal to Vertical). These slopes should be seeded and vegetation growth permitted to limit sloughing and/or erosion.
6. The lagoon interior slopes should be laid back at a ratio no steeper than 3:1 Horizontal to Vertical. Portions of the slopes above normal pool elevation should be protected from erosion. These slopes could either be seeded and vegetation growth permitted to limit sloughing and/or erosion, or riprap or other erosion protection materials could be placed. Erosion protection measures beyond vegetation will be required for some distance near the normal pool level of the pond. In the event that sloughing or erosion occurs, the slopes should be repaired.

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G. Clay Liner

1. The lagoon should be over-excavated slightly to allow for the construction of the recommended liner. The thickness of the required liner must be at least 12 inches thick, but will depend upon the allowable seepage rate from the lagoon. The liner thickness should also be increased just above and below the normal pool level. This is to help compensate for potential erosion, and wetting and drying of the liner material within this zone.
2. Following placement of embankment fill, clay liner material should be placed in layers not to exceed 6 inches in loose thickness, with each layer compacted to 98 percent of the maximum dry density as determined by ASTM D-698 standard method (AASHTO T-99), or as otherwise directed by the Soils Engineer. The soils should be compacted using a moisture content value 0 to 4 percent above optimum. Before placing additional layers the surface of the layer (minimum of 2 inches in depth) to receive fill should be scarified or roughened to achieve a good bond.
3. Placement of the liner and subsequently maintaining the liner material in a moist condition will determine the effectiveness of the liner. Also, the liner should be placed without any clods or gravel sizes larger than 2-inches in least lateral dimension. The liner should be kept moist or wet after placement and not allowed to dry. Desiccation cracking of the liner will result in increasing permeability of the liner by creating pathways.

VI. CHANGED CONDITIONS

The evaluations, conclusions, and recommendations in this report are based on our interpretation of the field and laboratory data obtained during the exploration, our understanding of the project and our experience with similar sites and subsurface conditions using generally accepted geotechnical engineering practices. Although individual test borings are representative of the subsurface conditions at the boring locations on the dates drilled, they are not necessarily representative of the subsurface conditions between boring locations or subsurface conditions during other seasons of the year.

In the event that changes in the project are proposed, additional information becomes available, or if it is apparent that subsurface conditions are different from those provided in this report, CTL Engineering should be notified so that our recommendations can be modified, if required.

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VII. TESTING AND OBSERVATION

During the design process, it is recommended that CTL Engineering work with the project designers to confirm that the geotechnical recommendations are properly incorporated into the final plans and specifications, and to assist with establishing criteria for the construction observation and testing.

CTL Engineering is not responsible for independent conclusions, opinions and recommendations made by others based on the data and recommendations provided in this report. It is recommended that CTL be retained to provide construction quality control services on this project. If CTL Engineering is not retained for these services, CTL shall assume no responsibility for compliance with the design concepts or recommendations provided.

VIII. CLOSING

This report has been prepared for the exclusive use of Milco Dairy and there representatives for use only on this project. Our services have been performed in accordance with generally accepted Geotechnical Engineering principles and practices. No warranty is either expressed or implied.

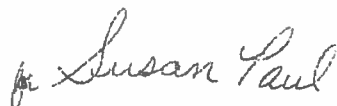
This report addresses only the geotechnical aspects of this project and does not include any environmental issues.

Specific design and construction recommendations have been provided in this report. Therefore, the report should be used in its entirety.

Respectfully Submitted,
CTL ENGINEERING, INC.



Frederick L. Schoen, P.E.
Project Manager



Kenneth Rush III, P.E.
Technical Reviewer

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APPENDIX A

TEST BORINGS RECORDS

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SOIL DESCRIPTION

Descriptors for soil consistency used in this report are based upon the Standard Penetration Test (SPT), ASTM D 1587, with the penetration (N) values corrected to N_{60} , based upon the efficiency of the SPT Hammer used for the soil sampling.

Descriptors for both non-cohesive and cohesive soils are presented below, with the corresponding range of corrected penetration values.

<u>NON-COHESIVE SOIL DESCRIPTION</u>	<u>CORRECTED PENETRATION VALUES BLOWS PER FOOT (BPF)</u>
Very Loose.....	0 – 4
Loose.....	5 – 10
Medium Dense.....	11 – 30
Dense.....	31 – 50
Very Dense.....	Over 50

<u>COHESIVE SOIL DESCRIPTION</u>	<u>CORRECTED PENETRATION VALUES BLOWS PER FOOT (BPF)</u>
Very Soft.....	0 – 1
Soft.....	2 – 4
Medium Stiff.....	5 – 8
Stiff.....	9 – 15
Very Stiff.....	16 – 30
Hard.....	Over 30

Moisture term descriptors for both non-cohesive and cohesive soils are presented below.

<u>NON-COHESIVE SOIL DESCRIPTION</u>	<u>MOISTURE TERMS</u>	<u>COHESIVE SOIL DESCRIPTION</u>
Powdery.....	Dry.....	Powdery
Some Moisture.....	Damp.....	Below Plastic Limit
Damp to the Touch.....	Moist.....	Above Plastic, Below Liquid Limit
Free Water.....	Wet.....	Above Liquid Limit

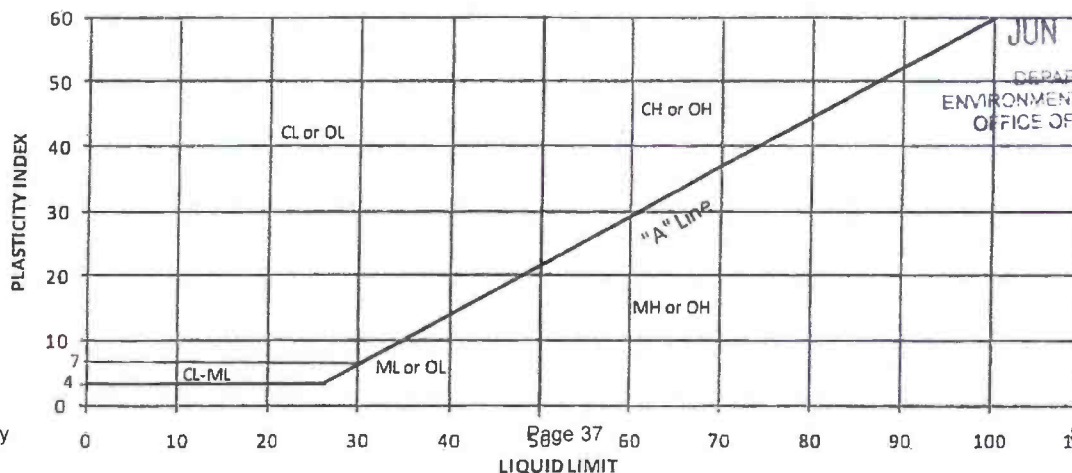
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SOIL DESCRIPTIONS BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM

ASTM D 2487 and D 2488

Major Division			Group Symbol	Letter Symbol	Group Name*		
Coarse Grained Soils Less Than 50 Percent Passing the # 200 Sieve	Gravel - Percent GRAVEL > percent SAND	Gravel with < 5% Fines		GW	Well Graded GRAVEL		
				GP	Poorly Graded GRAVEL		
		Gravel with Between 5 and 15% Fines		GW-GM	Well Graded GRAVEL with silt		
				GW-GC	Well Graded Gravel with clay		
				GP-GM	Poorly Graded GRAVEL with silt		
				GP-GC	Poorly Graded GRAVEL with clay		
	Sand - Percent SAND ≥ percent GRAVEL	Gravel with ≥ 15% Fines		GM	Silty GRAVEL		
				GC	Clayey GRAVEL		
		Sand with < 5% Fines		SW	Well Graded SAND		
				SP	Poorly Graded SAND		
		Sand with Between 5 and 15% Fines		SW-SM	Well Graded SAND with silt		
				SW-SC	Well Graded SAND with clay		
				Sand with ≥ 15% Fines		SP-SM	Poorly Graded SAND with silt
						SP-SC	Poorly Graded SAND with clay
Fine Grained Soils 50 percent or more Passing the # 200 Sieve	SILT and CLAY	Liquid Limit Less Than 50		SM	Silty SAND		
				SC	Clayey SAND		
				ML	SILT		
				CL	Lean CLAY		
		Liquid Limit 50 or Greater		CL-ML	SILTY CLAY		
				OL	Organic SILT, CLAY, or SILTY CLAY		
				MH	Elastic SILT		
				CH	Fat CLAY		
				OH	Organic SILT or CLAY		
Highly Organic Soils				PT	Peat		
* Additional Modifiers	Coarse Grained Soils	with silt or clay	5 to 12 % Silt or Clay by weight				
		Silty or Clayey	more than 12 % Silt or Clay by weight				
	Fine Grained Soils	with sand or gravel	15 to 29 % Sand or Gravel by weight				
		Sandy or Gravelly	30 % or more Sand or Gravel by weight				

"A" LINE GRAPH



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TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-01-13
 SHEET 1 OF 1
 DATE STARTED : 08-21-13
 DATE COMPLETED : 08-21-13

BORING ELEVATION : 100.6 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78614	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39861	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs ☒ Caved in at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.9		TOPSOIL / PLOW ZONE (8")	0.7										
				SS-1	3 4 4	11	33	20		9.0*			
	5	Stiff to Medium Stiff, Brown and Gray LEAN CLAY, Damp		SS-2	2 2 3	7	83	21		9.0*			
94.6			6.0	SS-3	2 4 5	13	100	12		6.0*			
		Stiff to Very Stiff, Brown SANDY SILTY CLAY with GRAVEL, Moist		SS-4	4 5 8	18	100	10		9.0*			
89.6			11.0	SS-5	4 5 6	15	100	12		7.0*			
	15	Stiff, Gray SANDY LEAN CLAY, Damp to Moist		SS-6	3 4 5	13	100	11		4.0*			
80.6	20	BOTTOM OF BORING	20.0										

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 Email: ctl@ctleng.com



BORING METHOD
 HSA - Hollow Stem Auger
 SFA - Solid Flight Auger
 RC - Rock Coring
 MD - Mud Drilling
 WD - Wash Drilling
 HA - Hand Auger

SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
 CR - Rock Core Sample
 BS - Bag Sample

ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% D_{min} Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-02-13
 SHEET 1 OF 1
 DATE STARTED : 08-21-13
 DATE COMPLETED : 08-21-13

BORING ELEVATION : 101.6 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78613	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39787	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs ☒ Caved in at 18.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N60	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
100.9		TOPSOIL / PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4 4 4	11	83	20		9.0*			
98.6			3.0										
	5	Medium Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Moist		SS-2	3 3 3	8	100	9					
96.1			5.5										
		Medium Stiff to Stiff, Brown SANDY SILTY CLAY, Moist		SS-3	6 5 5	14	17	10					
93.6			8.0										
	10			SS-4	3 3 3	8	100	13		6.0*			
		Stiff, Gray SANDY LEAN CLAY, Damp to Moist											
	15			SS-5	4 5 5	14	100	11		8.0*			
81.6	20		20.0	SS-6	3 5 6	15	67	12		9.0*			
		BOTTOM OF BORING											

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BORING METHOD
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SAMPLING METHOD
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ABBREVIATIONS
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 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N60 - Standard Penetration
 Normalized to 60% Drift Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility
LOCATION : Lewisville, IN - Rush County
PROJECT NO. : 13050048WAP

BORING NO.: B-03-13
SHEET 1 OF 1
DATE STARTED : 08-22-13
DATE COMPLETED : 08-22-13

BORING ELEVATION : 100.3 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78552	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39867	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs Caved In at 18.3'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.6		TOPSOIL/PLOW ZONE (8")	0.7										
		Medium Stiff, Brown and Gray LEAN CLAY, Damp		SS-1	4 4 4	11	67	16		9.0"			
97.3			3.0										
	5	Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-2	4 4 5	13	100	9		9.0"			
94.3			6.0										
		Stiff, Brown SANDY SILTY CLAY with GRAVEL, Damp		SS-3	4 5 5	14	83	11		9.0"			
	10			SS-4	5 5 6	15	100	11		9.0"			
88.3			12.0										
	15	Very Stiff to Stiff, Gray SANDY LEAN CLAY, Damp to Moist		SS-5	4 5 7	17	100	11		8.0"			
80.3	20		20.0	SS-6	3 3 4	10	100	11		4.0"			
		BOTTOM OF BORING											

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BORING METHOD
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WD - Wash Drilling
HA - Hand Auger

SAMPLING METHOD
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PL - Plastic Limit
PI - Plasticity Index
SPT - Standard Penetration Test
N₆₀ - Standard Penetration
Normalized to 60% Drill Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-04-13
 SHEET 1 OF 1
 DATE STARTED : 08-22-13
 DATE COMPLETED : 08-22-13

BORING ELEVATION : <u>99.3 Feet</u>	RIG TYPE : <u>ATV 550</u>	DRILLER : <u>ED</u>
STATION : <u>39.78549</u>	CASING DIA. : <u>3.25"</u>	TEMPERATURE : <u>86°</u>
OFFSET : <u>-85.39784</u>	CORE SIZE : <u>n/a</u>	WEATHER : <u>Clear</u>
DEPTH : <u>20.0 Feet</u>	HAMMER : <u>Automatic</u>	
BORING METHOD : <u>HSA</u>	ENERGY RATIO : <u>84.0</u>	

GROUNDWATER: Encountered at 6.0' At completion Dry Delayed Reading 6.5 @ 24 Hrs Caved in at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
98.6		TOPSOIL / PLOW ZONE (8")	0.7										
				SS-1	4 4 4	11	67	17		9.0*			
	5	Stiff to Medium Dark Brown LEAN CLAY with SAND, Damp to Moist		SS-2	2 2 2	6	28	24		4.0*			
93.3		SAND SEAM, Wet	6.0										
92.8		Medium Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Moist	6.5	SS-3	4 3 3	8	100	18					
91.3			8.0	SS-4	5 5 6	15	100	8		7.0*			
	10	Stiff, Brown SANDY SILTY CLAY with GRAVEL, Moist											
88.3			11.0	SS-5	12 16 8	34	22	12		9.0*			
	15	Hard to Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp											
				SS-6	8 7 9	22	33	9		7.0*			
79.3	20	BOTTOM OF BORING	20.0										

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BORING METHOD
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 N₆₀ - Standard Penetration
 Normalized to 60% Drill Rod R

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-05-13
 SHEET 1 OF 1
 DATE STARTED : 08-22-13
 DATE COMPLETED : 08-22-13

BORING ELEVATION : <u>99.0 Feet</u>	RIG TYPE : <u>ATV 550</u>	DRILLER : <u>ED</u>
STATION : <u>39.78489</u>	CASING DIA. : <u>3.25"</u>	TEMPERATURE : <u>86°</u>
OFFSET : <u>-85.39868</u>	CORE SIZE : <u>n/a</u>	WEATHER : <u>Clear</u>
DEPTH : <u>20.0 Feet</u>	HAMMER : <u>Automatic</u>	
BORING METHOD : <u>HSA</u>	ENERGY RATIO : <u>84.0</u>	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading 9.0 @ 24 Hrs ☒ Caved in at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS
											LL PL PI
98.3		TOPSOIL/PLOW ZONE (8")	0.7								
				SS-1	5 5 6	15	67	9			
	5	Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL with few Cobbles, Damp		SS-2	4 4 5	13	83	10		6.0*	
93.0			6.0								
		Hard, Brown, SANDY SILTY CLAY, Damp		SS-3	12 15 19	48	17	9			
91.0			8.0								
	10			SS-4	5 6 7	18	100	6		9.0*	
		Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp									
	15			SS-5	5 6 8	20	100	11		9.0*	
80.0			19.0								
		Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-6	10 14 9	32	67	10		9.0*	
79.0	20	BOTTOM OF BORING	20.0								

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 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% DMT Rock

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-06-13
 SHEET 1 OF 1
 DATE STARTED : 08-22-13
 DATE COMPLETED : 08-22-13

BORING ELEVATION : <u>101.2 Feet</u>	RIG TYPE : <u>ATV 550</u>	DRILLER : <u>ED</u>
STATION : <u>39.78486</u>	CASING DIA. : <u>3.25"</u>	TEMPERATURE : <u>86°</u>
OFFSET : <u>-85.39786</u>	CORE SIZE : <u>n/a</u>	WEATHER : <u>Clear</u>
DEPTH : <u>20.0 Feet</u>	HAMMER : <u>Automatic</u>	
BORING METHOD : <u>HSA</u>	ENERGY RATIO : <u>84.0</u>	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs Caved in at 17.7'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
100.5		TOPSOIL/PLOW ZONE (8")	0.7										
				SS-1	3 3 4	10	83	25		6.0*	43	18	25
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp to Moist											
	5			SS-2	3 4 4	11	100	13		5.0*			
95.7			5.5										
				SS-3	3 3 3	8	83	12		5.0*	19	13	6
		Medium Stiff to Stiff, Brown SANDY SILTY CLAY with GRAVEL, Moist											
	10			SS-4	3 3 4	10	100	11		7.0*			
89.2			12.0										
				SS-5	4 5 5	14	100	9		9.0*			
	15												
		Stiff, Gray SANDY LEAN CLAY, Damp											
				SS-6	4 5 6	15	100	11		8.5*			
81.2	20	BOTTOM OF BORING	20.0										

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ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY



102 Commerce Drive
 P.O. Box 44
 Wapakoneta, Ohio 45895
 Telephone: 419-738-1447
 Fax: 419-738-7670
 Email: ctl@ctleng.com

BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% DRY ROD ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-07-13
 SHEET 1 OF 1
 DATE STARTED : 08-22-13
 DATE COMPLETED : 08-22-13

BORING ELEVATION : 103.5 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78595	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39751	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading 16.0 @ 24 Hrs Caved in at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
102.8		TOPSOIL/PLOW ZONE (8")	0.7										
		Very Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	6 9 12	29	67	6		9.0*			
99.5	5	Very Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp	4.0	SS-2	6 7 8	21	100	10		9.0*			
97.5		Very Stiff, Brown SILTY CLAY with GRAVEL, Damp	6.0	SS-3	4 6 7	18	100	13		9.0*			
95.5			8.0	SS-4	6 8 8	22	100	12		8.0*			
	10	Very Stiff to Stiff, Gray SANDY LEAN CLAY with GRAVEL with few Cobbles, Damp to Moist		SS-5	4 4 5	13	100	11		6.0*			
84.5		Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp	19.0	SS-6	7 10 13	32	67	7		9.0*			
83.5	20	BOTTOM OF BORING	20.0										

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SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
 CR - Rock Core Sample
 BS - Bag Sample

ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% RH Rod ER

County Line Dairy

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility
LOCATION : Lewisville, IN - Rush County
PROJECT NO. : 13050048WAP

BORING NO.: B-08-13
SHEET 1 OF 1
DATE STARTED : 08-22-13
DATE COMPLETED : 08-22-13

BORING ELEVATION : 100.8 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78546	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39721	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: ☒ Encountered at 14.0' ☒ At completion 17.2' Delayed Reading 10.0 @ 24 Hrs ☒ Caved in at 18.1'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
100.1		TOPSOIL/PLOW ZONE (8")	0.7										
		Medium Stiff, Brown and Gray LEAN CLAY, Damp		SS-1	4 4 5	13	83	20		9.0*			
97.8			3.0										
		Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-2	4 4 6	14	100	9		9.0*			
95.3	5		5.5										
		Stiff, Brown SANDY SILTY CLAY, Moist		SS-3	4 5 5	14	100	18		6.0*			
92.8			8.0										
		Stiff, Dark Brown with Gray SANDY LEAN CLAY with Sand Seams, Moist		SS-4	3 4 5	13	100	13		5.0*			
86.8	10		14.0										
85.8		Medium Dense, Gray WELL-GRADED SAND with GRAVEL, Wet	15.0	SS-5	5 6 6	17	17	12					
	15												
		Stiff, Gray SANDY LEAN CLAY with GRAVEL, Moist		SS-6	4 5 5	14	100	10		9.0*			
80.8	20		20.0										
		BOTTOM OF BORING											

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BORING METHOD
HSA - Hollow Stem Auger
SFA - Solid Flight Auger
RC - Rock Coring
MD - Mud Drilling
WD - Wash Drilling
HA - Hand Auger

SAMPLING METHOD
SS - Split Spoon Sample
ST - Shelby Tube Sample
CR - Rock Core Sample
BS - Bag Sample

ABBREVIATIONS
* - Hand Penetrometer
LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
SPT - Standard Penetration Test
N₆₀ - Standard Penetration Test
Normalized to 60% Drill Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility
LOCATION : Lewisville, IN - Rush County
PROJECT NO. : 13050048WAP

BORING NO.: B-09-13
SHEET 1 OF 1
DATE STARTED : 08-21-13
DATE COMPLETED : 08-21-13

BORING ELEVATION : 102.4 Feet
STATION : 39.78609
OFFSET : -85.39890
DEPTH : 20.0 Feet
BORING METHOD : HSA
RIG TYPE : ATV 550
CASING DIA. : 3.25"
CORE SIZE : n/a
HAMMER : Automatic
ENERGY RATIO : 84.0
DRILLER : ED
TEMPERATURE : 86°
WEATHER : Clear

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs ☒ Caved in at 18.2'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N60	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP. ksf	ATTERBERG LIMITS		
											LL	PL	PI
101.7		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4 4 5	13	67	23		9.0*			
99.4			3.0										
	5	Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-2	3 4 5	13	100	12		9.0*	24	14	10
96.4			6.0										
				SS-3	2 3 3	8	100	14		7.0*			
		Medium Stiff, Brown SANDY SILTY CLAY, Moist		SS-4	3 3 3	8	100	14		8.0*			
90.4			12.0										
	15	Stiff to Medium Stiff, Gray SANDY LEAN CLAY, Damp to Moist		SS-5	3 4 5	13	100	11		8.0*			
82.4	20	BOTTOM OF BORING	20.0	SS-6	2 3 3	8	100	12		9.0*			

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N60 - Standard Penetration
		Normalized to 60% CHL RDR ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-10-13
 SHEET 1 OF 1
 DATE STARTED : 08-21-13
 DATE COMPLETED : 08-21-13

BORING ELEVATION : 101.0 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78609	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39619	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading 9.5 @24 Hrs ☒ Caved in at 18.3'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP. ksf	ATTERBERG LIMITS		
											LL	PL	PI
100.3		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY, Damp		SS-1	3 3 4	10	67	23		8.0*			
98.0			3.0										
	5	Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Moist		SS-2	3 3 4	10	100	10		9.0*			
94.0			7.0										
		Medium Dense, Brown SANDY SILT, Non-Plastic, Moist		SS-3	5 6 6	17	100	21					
92.0			9.0										
	10			SS-4	3 4 4	11	100	11		3.0*			
	15	Very Stiff, Gray SANDY LEAN CLAY with GRAVEL with few Cobbles and Sand Seams, Moist		SS-5	6 7 8	21	11						
81.0	20	BOTTOM OF BORING	20.0	SS-6	6 6 7	18	100	11		7.5*			

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 HSA - Hollow Stem Auger
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 MD - Mud Drilling
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SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
 CR - Rock Core Sample
 BS - Bag Sample

ABBREVIATIONS

* - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration Test Normalized to 60% Drill Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-11-13
 SHEET 1 OF 1
 DATE STARTED : 08-21-13
 DATE COMPLETED : 08-21-13

BORING ELEVATION : <u>101.4 Feet</u>	RIG TYPE : <u>ATV 550</u>	DRILLER : <u>ED</u>
STATION : <u>39.78553</u>	CASING DIA. : <u>3.25"</u>	TEMPERATURE : <u>86°</u>
OFFSET : <u>-85.39687</u>	CORE SIZE : <u>n/a</u>	WEATHER : <u>Clear</u>
DEPTH : <u>20.0 Feet</u>	HAMMER : <u>Automatic</u>	
BORING METHOD : <u>HSA</u>	ENERGY RATIO : <u>84.0</u>	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs ~~1/2~~ Caved In at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
100.7		Stiff, Brown with Gray LEAN CLAY with SAND, Damp	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4 4 5	13	100	22		9.0*			
98.4			3.0										
		Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Moist		SS-2	5 6 5	15	100	9		9.0*			
95.9	5		5.5										
				SS-3	3 3 3	8	100	11		2.0*			
		Medium Stiff to Stiff, Brown SANDY SILTY CLAY, Damp		SS-4	4 4 5	13	100	15		2.5*			
89.4	10		12.0										
		Very Stiff, Gray SANDY LEAN CLAY, Damp		SS-5	5 7 8	21	83	16		9.0*			
	15												
81.4	20		20.0	SS-7	5 6 7	18	100	15		9.0*			
		BOTTOM OF BORING											

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% Drill Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-12-13
 SHEET 1 OF 1
 DATE STARTED : 08-21-13
 DATE COMPLETED : 08-21-13

BORING ELEVATION : 99.6 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78548	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39620	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: ☒ Encountered at 7.0' At completion Dry Delayed Reading 9.0 @ 24-Hrs ☒ Caved In at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N60	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
98.9		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4					9.0"			
97.1			2.5		4	13	100	19					
					5								
	5	Very Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-2	5					9.0"			
					6	17	100	8					
					6								
93.6		Medium Dense, Brown SILTY SAND Fine to Coarse Sand, Non Plastic, Moist	6.0		6								
92.6			7.0	SS-3	4	13	100	16					
92.1		Brown SAND SEAM, Wet	7.5		5								
	10	Stiff, Brown SANDY SILT, Moist		SS-4	4					3.0"			
					5	14	100	20					
					5								
87.6			12.0										
				SS-5	5					5.0"			
					6	18	83	13					
					7								
	15	Very Stiff to Stiff, Gray SANDY LEAN CLAY with GRAVEL, Moist to Damp											
				SS-6	4					9.0"			
					5	15	100	9					
					6								
79.6	20	BOTTOM OF BORING	20.0										

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BORING METHOD
 HSA - Hollow Stem Auger
 SFA - Solid Flight Auger
 RC - Rock Coring
 MD - Mud Drilling
 WD - Wash Drilling
 HA - Hand Auger

SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
 CR - Rock Core Sample
 BS - Bag Sample

ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N60 - Standard Penetration
 Normalized to 60% Drift Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-13-13
 SHEET 1 OF 1
 DATE STARTED : 08-22-13
 DATE COMPLETED : 08-22-13

BORING ELEVATION : 99.7 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78450	CASING DIA. : 3.25"	TEMPERATURE : 85°
OFFSET : -85.39787	CORE SIZE : n/a	WEATHER : Cloudy
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading Dry @ 24-Hrs Caved in at 17.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.0		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY, Damp		SS-1	4 4 5	13	67	17		9.0*			
97.2			2.5										
	5	Very Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-2	5 6 6	17	100	10		9.0*			
93.7			6.0										
		Stiff, Brown SILTY CLAY, Damp to Moist		SS-3	4 5 4	13	67	14		8.0*			
	10			SS-4	4 4 4	11	100	20					
87.7			12.0										
	15	Stiff to Very Stiff, Gray SANDY LEAN CLAY, Damp		SS-5	5 5 6	15	100	10		9.0*			
79.7	20	BOTTOM OF BORING	20.0	SS-6	5 6 7	18	100	10		9.0*			

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ABBREVIATIONS
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 LL - Liquid Limit
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 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% Blows per Foot

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-14-13
 SHEET 1 OF 1
 DATE STARTED : 08-24-13
 DATE COMPLETED : 08-24-13

BORING ELEVATION : 96.9 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78418	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39842	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 20.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading 15.2 @ 24-Hrs Caved in at 18.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
96.2		TOPSOIL/PLOW ZONE (8")	0.7										
		Very Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	3 5 7	17	67	14		9.0*			
94.4			2.5										
		Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-2	3 4 5	13	100	10		9.0*			
91.4	5		5.5										
				SS-3	3 3 4	10	100	19		6.0*			
		Stiff, Brown LEAN CLAY with SAND, Damp		SS-4	3 4 4	11	100	14		6.0*			
84.9	10		12.0										
				SS-5	4 6 7	18	100	12		9.0*			
	15	Very Stiff, Gray SANDY LEAN CLAY, Damp											
76.9	20		20.0	SS-6	5 5 7	17	100	18		7.0*			
		BOTTOM OF BORING											

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SAMPLING METHOD
 SS - Split Spoon Sample
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 BS - Bag Sample

ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% Drilled

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-15-13
 SHEET 1 OF 2
 DATE STARTED : 08-23-13
 DATE COMPLETED : 08-23-13

BORING ELEVATION : 99.8 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78513	CASING DIA. : 3.25"	TEMPERATURE : 85°
OFFSET : -85.39745	CORE SIZE : n/a	WEATHER : Cloudy
DEPTH : 30.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at 15.0' At completion 9.5' Delayed Reading 7.7 @ 24-Hrs Caved in at 10.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N60	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.1		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Dark Brown LEAN CLAY with SAND, Damp		SS-1	4 4 4	11	67	17		9.0*			
96.8			3.0										
	5			SS-2	3 2 2	6	100	16		2.5*			
		Medium Stiff, Brown SANDY SILTY CLAY with Cobbles, Moist		SS-3	3 3 3	8	100	11		5.0*			
				SS-4	50-5"		0						
87.8			12.0										
		Very Stiff, Gray SILT with SAND, Moist		SS-5	5 6 8	20	83	15					
84.8	15		15.0										
		SAND SEAM, Wet											
83.8			16.0										
		Hard to Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-6	7 10 13	32	100	12		7.5*			
	20												

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BORING METHOD
 HSA - Hollow Stem Auger
 SFA - Solid Flight Auger
 RC - Rock Coring
 MD - Mud Drilling
 WD - Wash Drilling
 HA - Hand Auger

SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
 CR - Rock Core Sample
 BS - Bag Sample

ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N60 - Standard Penetration
 Normalized to 60% Blow Energy

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility

BORING NO.: B-15-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
25		Hard to Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-7	7 8 9	24	100	10		9.0*			
69.8	30			SS-8	4 6 8	20	100	11		5.0*			
			30.0										
		BOTTOM OF BORING											
35													
40													
45													

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% Drift Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-16-13
 SHEET 1 OF 2
 DATE STARTED : 08-23-13
 DATE COMPLETED : 08-23-13

BORING ELEVATION : 98.8 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78510	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39624	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 30.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: Encountered at 8.0' At completion Dry Delayed Reading 8.0 @ 24-Hrs Caved in at 27.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
98.1		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	3 3 4	10	83	20		9.0*			
95.8			3.0										
	5	Medium Stiff, Brown with Gray SANDY SILTY CLAY with GRAVEL, Damp to Moist		SS-2	2 3 3	8	100	11		4.0*			
91.8			7.0										
		Medium Dense, Brown POORLY-GRADED SAND, Fine to Medium Sand, Wet		SS-3	7 11 14	35	100	10					
89.8			9.0										
	10	Very Stiff, Gray LEAN CLAY with SAND, Damp to Moist		SS-4	6 7 7	20	100	19		5.0*			
86.8			12.0										
	15	Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-5	5 6 6	17	83	12		9.0*			
80.8			18.0										
	20	Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-6	7 9 11	28	100	11		9.0*			

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% DRY ROCKET

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility

BORING NO.: B-16-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
25		Very Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-7	8 9 10	27	100	10		9.0*			
30				SS-8	12 9 8	24	50	10		9.0*			
68.8	30	BOTTOM OF BORING	30.0										
35													
40													
45													

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HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
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MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% Drill Rod ER

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E, 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 1305004BWAP

BORING NO.: B-17-13
 SHEET 1 OF 2
 DATE STARTED : 08-23-13
 DATE COMPLETED : 08-23-13

BORING ELEVATION : 100.0 Feet
 STATION : 39.78481
 OFFSET : -85.39677
 DEPTH : 30.0 Feet
 BORING METHOD : HSA
 RIG TYPE : ATV 550
 CASING DIA. : 3.25"
 CORE SIZE : n/a
 HAMMER : Automatic
 ENERGY RATIO : 84.0
 DRILLER : ED
 TEMPERATURE : 85°
 WEATHER : Cloudy

GROUNDWATER: ☒ Encountered at 24.7' ☒ At completion 20.0' Delayed Reading 9.3 @ 24-Hrs ☒ Caved in at 26.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.3		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff to Medium Stiff, Brown and Gray LEAN CLAY, Damp to Moist		SS-1	4 4 4	11	100	22		8.0*			
	5			SS-2	3 3 3	8	100	26		4.5*			
94.5		Stiff, Brown SANDY SILTY CLAY with GRAVEL, Moist	5.5	BS-1									
				SS-3	4 4 6	14	100	11		5.0*			
90.5	10	Dense, Brown POORLY-GRADED SAND with SILT, Fine to Coarse Sand, Moist	9.5	SS-4	9 14 17	43	100	17					
88.0			12.0										
	15	Very Stiff, Gray SANDY LEAN CLAY, Damp		SS-5	5 8 10	25	100	11		9.0*			
				ST-1									
82.0		Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp	18.0	SS-6	9 11 13	34	100	11		9.0*	22	12	10

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BORING METHOD	SAMPLING METHOD	ABBREVIATIONS
HSA - Hollow Stem Auger	SS - Split Spoon Sample	* - Hand Penetrometer
SFA - Solid Flight Auger	ST - Shelby Tube Sample	LL - Liquid Limit
RC - Rock Coring	CR - Rock Core Sample	PL - Plastic Limit
MD - Mud Drilling	BS - Bag Sample	PI - Plasticity Index
WD - Wash Drilling		SPT - Standard Penetration Test
HA - Hand Auger		N ₆₀ - Standard Penetration
		Normalized to 60% Relative Humidity

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility

BORING NO.: B-17-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP. ksf	ATTERBERG LIMITS		
											LL	PL	PI
		Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp		ST-2									
75.3	25		24.7	SS-7	5	41	100	12		9.0*			
75.0		SAND SEAM, Wet	25.0		12								
					17								
		Hard, Gray SANDY LEAN CLAY, Damp											
70.0	30		30.0	SS-8	8	39	100	12		4.0*			
					13								
					15								
		BOTTOM OF BORING											
	35												
	40												
	45												

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LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
SPT - Standard Penetration Test
N₆₀ - Standard Penetration
Normalized to 60% Relative Humidity

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-18-13
 SHEET 1 OF 2
 DATE STARTED : 08-23-13
 DATE COMPLETED : 08-23-13

BORING ELEVATION : 98.5 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78448	CASING DIA. : 3.25"	TEMPERATURE : 85°
OFFSET : -85.39675	CORE SIZE : n/a	WEATHER : Cloudy
DEPTH : 30.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: ☒ Encountered at 22.0' ☒ At completion 18.5' Delayed Reading 14.0 @ 24-Hrs ☒ Caved in at 22.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
97.8		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4 4 5	13	83	16		9.0*			
	5			SS-2	4 4 4	11	100	25		6.0*			
92.5		Medium Dense, Brown SILT with thin Sand Seams, Non-Plastic, Moist	6.0										
92.0			6.5	SS-3	6 6 7	18	100	22		7.0*			
				SS-4	4 6 8	20	100	10		9.0*			
	10			BS-1									
		Very Stiff to Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp											
	15			SS-5	8 12 14	36	100	10		9.0*			
	20			SS-6	5 9 12	29	100	10		9.0*			

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BORING METHOD
 HSA - Hollow Stem Auger
 SFA - Solid Flight Auger
 RC - Rock Coring
 MD - Mud Drilling
 WD - Wash Drilling
 HA - Hand Auger

SAMPLING METHOD
 SS - Split Spoon Sample
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ABBREVIATIONS
 * - Hand Penetrometer
 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% RRR

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N, Facility

BORING NO.: B-18-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
76.5		Very Stiff to Hard, Gray SANDY LEAN CLAY with GRAVEL, Damp	22.0	ST-1									
74.5		Gray SILTY SAND with GRAVEL, Fine to Medium Sand, Wet	24.0	SS-7	4 5 5	14	100	23		3.0*			
71.5		Stiff, Gray SILT with Black Organic Depletions, Moist	27.0										
68.5		Stiff, Gray SILTY CLAY with SAND, Moist	30.0	SS-8	3 4 5	13	100	20		2.0*			
		BOTTOM OF BORING											

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SPT - Standard Penetration Test
N₆₀ - Standard Penetration
Normalized to 60% Blows per Foot

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-19-13
 SHEET 1 OF 2
 DATE STARTED : 08-24-13
 DATE COMPLETED : 08-24-13

BORING ELEVATION : 98.2 Feet	RIG TYPE : ATV 550	DRILLER : ED
STATION : 39.78418	CASING DIA. : 3.25"	TEMPERATURE : 86°
OFFSET : -85.39742	CORE SIZE : n/a	WEATHER : Clear
DEPTH : 30.0 Feet	HAMMER : Automatic	
BORING METHOD : HSA	ENERGY RATIO : 84.0	

GROUNDWATER: ☒ Encountered at 17.0' ☒ At completion 20.0' Delayed Reading 9.7 @ 24-Hrs ☒ Caved in at 27.0'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
97.5		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY, Damp		SS-1	4 4 5	13	67	17		9.0"			
95.7			2.5										
		Medium Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp to Moist		SS-2	3 3 3	8	83	12					
92.7	5		5.5										
		Stiff, Brown SANDY SILTY CLAY, Damp		SS-3	3 3 4	10	100	10		6.0"			
90.2			8.0										
		Medium Dense, Brown SILTY SAND with GRAVEL with Silt Lenses, Moist		SS-4	7 9 11	28	100	16					
86.2	10		12.0										
		Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-5	5 5 6	15	100	10		9.0"			
81.2	15		17.0										
80.7		Gray SAND SEAM, Wet	17.5										
		Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-6	4 5 6	15	33	11					

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BORING METHOD
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SAMPLING METHOD
 SS - Split Spoon Sample
 ST - Shelby Tube Sample
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ABBREVIATIONS
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 LL - Liquid Limit
 PL - Plastic Limit
 PI - Plasticity Index
 SPT - Standard Penetration Test
 N₆₀ - Standard Penetration
 Normalized to 60% Efficiency

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility

BORING NO.: B-19-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
	25	Stiff, Gray SANDY LEAN CLAY with GRAVEL, Damp		SS-7	3 4 4	11	100	13		5.0*			
68.2	30	BOTTOM OF BORING	30.0	SS-8	3 4 5	13	100	13		5.0*			
	35												
	40												
	45												

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LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
SPT - Standard Penetration Test
N₆₀ - Standard Penetration Normalized to 60% D_{min} Rod

TEST BORING RECORD

CLIENT : Milco Dairy
 PROJECT : County Road E. 1200 N. Facility
 LOCATION : Lewisville, IN - Rush County
 PROJECT NO. : 13050048WAP

BORING NO.: B-20-13
 SHEET 1 OF 2
 DATE STARTED : 08-24-13
 DATE COMPLETED : 08-24-13

BORING ELEVATION : <u>100.0 Feet</u>	RIG TYPE : <u>ATV 550</u>	DRILLER : <u>ED</u>
STATION : <u>.9.78416</u>	CASING DIA. : <u>3.25"</u>	TEMPERATURE : <u>86°</u>
OFFSET : <u>-85.39619</u>	CORE SIZE : <u>n/a</u>	WEATHER : <u>Clear</u>
DEPTH : <u>30.0 Feet</u>	HAMMER : <u>Automatic</u>	
BORING METHOD : <u>HSA</u>	ENERGY RATIO : <u>84.0</u>	

GROUNDWATER: Encountered at Dry At completion Dry Delayed Reading 16.1 @24-Hrs Caved in at 27.5'

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N 60	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
99.3		TOPSOIL/PLOW ZONE (8")	0.7										
		Stiff, Brown and Gray LEAN CLAY with SAND, Damp		SS-1	4 4 4	11	83	16		9.0*			
96.0	5	Very Stiff, Brown with Gray SANDY LEAN CLAY with GRAVEL, Damp	4.0	SS-2	5 8 8	22	100	8		9.0*			
				SS-3	5 6 7	18	33	11					
92.0	10	Very Stiff, Brown SANDY SILTY CLAY, Moist	8.0	SS-4	4 7 9	22	83	14					
88.0	15	Stiff, Gray SANDY LEAN CLAY with Few Thin Sand Seams, Damp	12.0	SS-5	3 4 5	13	100	11		8.0*			
	20			SS-6	4 5 6	15	100	10		9.0*			

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 N60 - Standard Penetration
 Normalized to 60% Blows per Foot

TEST BORING RECORD

CLIENT : Milco Dairy
PROJECT : County Road E. 1200 N. Facility

BORING NO.: B-20-13
SHEET 2 OF 2

STRATUM ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	STRATUM DEPTH	SAMPLE NUMBER	SPT per 6"	N ₆₀	RECOVERY (%)	MOISTURE CONTENT	TOTAL UNIT WEIGHT pcf	UNCONF. COMP., ksf	ATTERBERG LIMITS		
											LL	PL	PI
25		Stiff, Gray SANDY LEAN CLAY with Few Thin Sand Seams, Damp		SS-7	4 12 14	36	83	12		9.0*			
30				SS-8	8 10 12	31	100	15		9.0*			
70.0	30	BOTTOM OF BORING	30.0										
35													
40													
45													

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Fax: 419-738-7670
Email: ctl@ctleng.com

BORING METHOD
HSA - Hollow Stem Auger
SFA - Solid Flight Auger
RC - Rock Coring
MD - Mud Drilling
WD - Wash Drilling
HA - Hand Auger
Page 63

SAMPLING METHOD
SS - Split Spoon Sample
ST - Shelby Tube Sample
CR - Rock Core Sample
BS - Bag Sample

ABBREVIATIONS
* - Hand Penetrometer
LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
SPT - Standard Penetration Test
N₆₀ - Standard Penetration
Normalized to 60% Blows per Foot

APPENDIX B

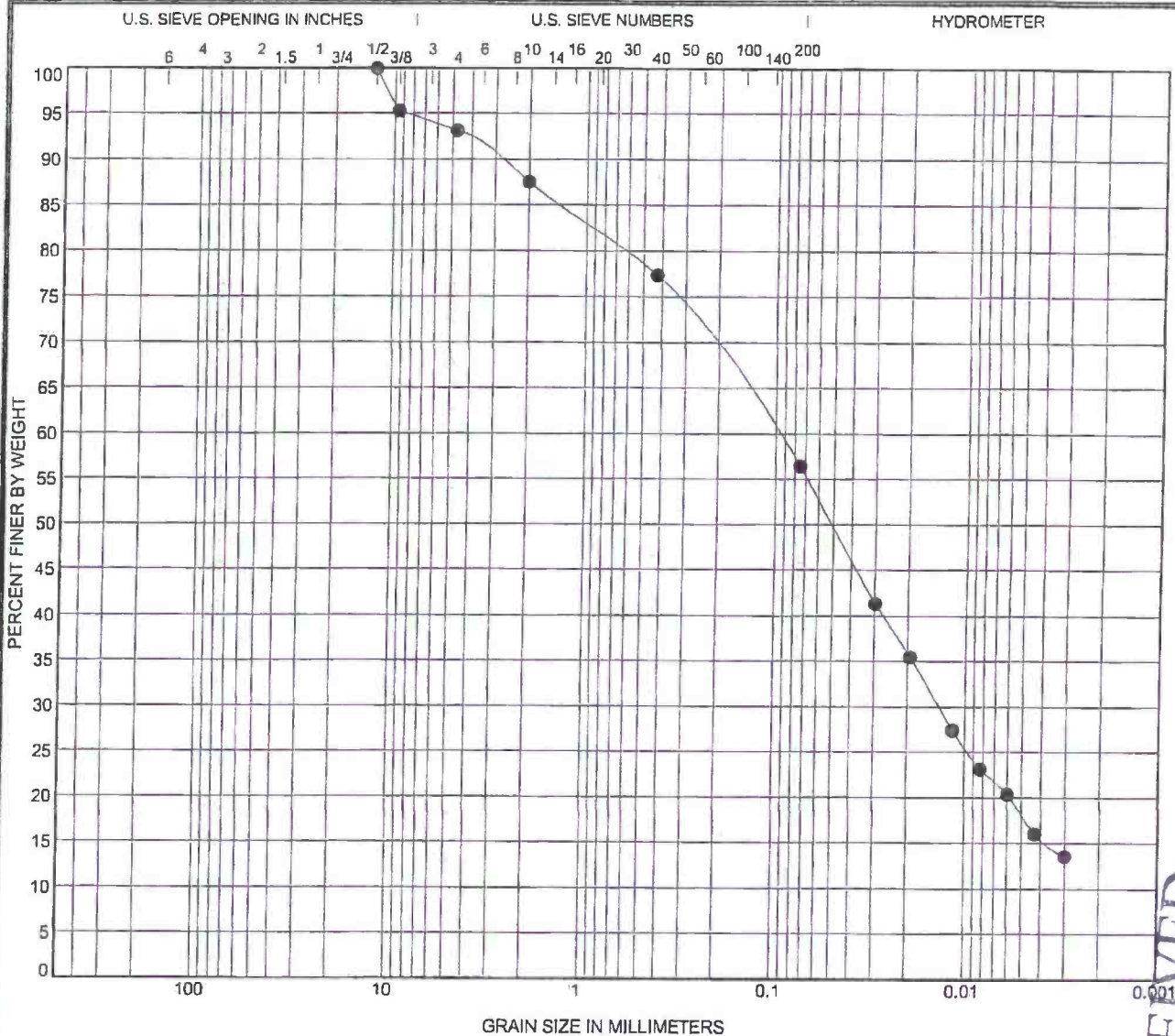
LABORATORY TEST RESULTS

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample	Depth	Classification	%MC	LL	PL	PI	Cc
●B-06-13	SS-3	6.0	SANDY SILTY CLAY(CL-ML)	12	19	13	6	

Boring No.	Sample	Depth	D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●B-06-13	SS-3	6.0	12.5	0.101	0.05	0.014		7	37	38	18

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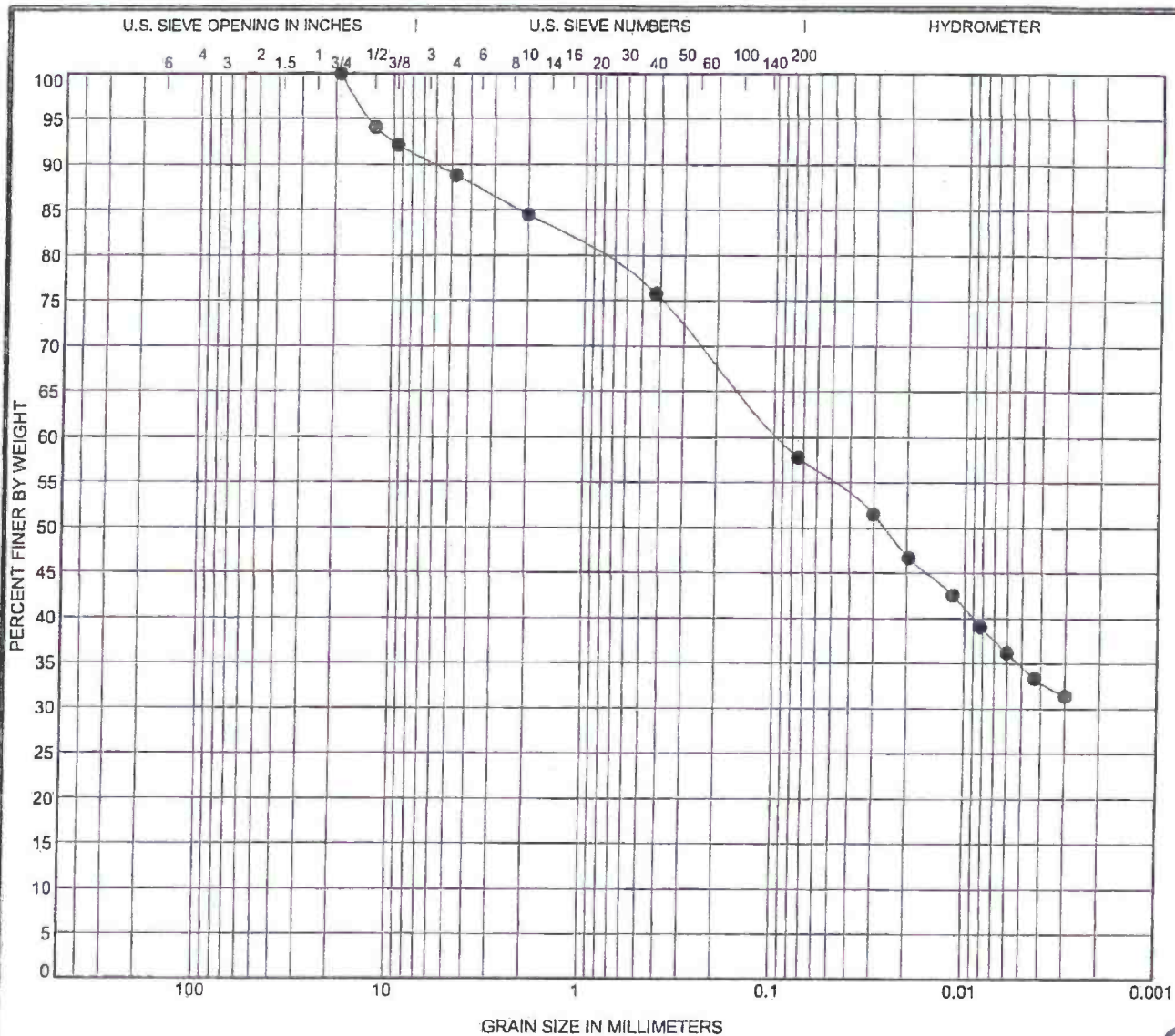
GRAIN SIZE DISTRIBUTION

Project: County Road E. 1200 N. Facility

Location: Lewisville, IN - Rush County

Project Number: 13050048WAP

Subsurface information



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample	Depth	Classification				%MC	LL	PL	PI	Cc	Cl
●B-09-13	SS-2	3.5	SANDY LEAN CLAY(CL)				12	24	14	10		
Boring No.	Sample	Depth	D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●B-09-13	SS-2	3.5	19	0.093	0.026			11	31	23	35	



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GRAIN SIZE DISTRIBUTION

Project: County Road E. 1200 N. Facility
Location: Lewisville, IN - Rush County

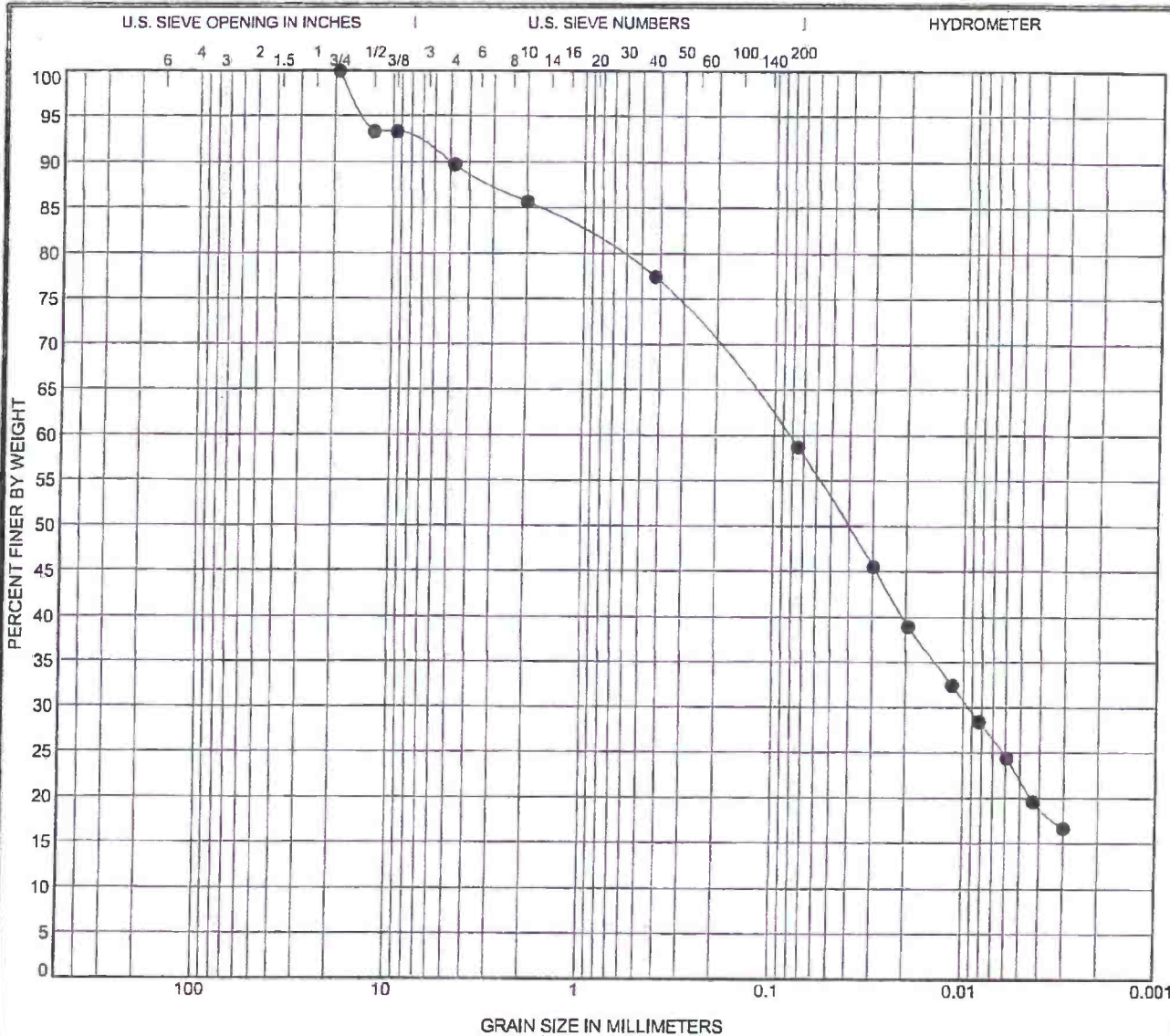
Page 17 Project Number: 13050048WAP

Subsurface Information

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample	Depth	Classification	%MC	LL	PL	PI	Cc	Cu
●B-17-13	SS-6	18.5	SANDY LEAN CLAY(CL)	11	22	12	10		

Boring No.	Sample	Depth	D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●B-17-13	SS-6	18.5	19	0.084	0.041	0.009		10	31	37	22

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CTL Engineering
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Fax: (419) 738-7670

GRAIN SIZE DISTRIBUTION
Project: County Road E. 1200 N. Facility
Location: Lewisville, IN - Rush County
Project Number: 13050048WAP

Subsurface Information

GRADATION - WAPAK 13050048WAP.GPJ NEW CTL WITH N60.GDT 9/25/13

CTL Engineering, Inc.
2860 Fisher Road, PO Box 44548
Columbus, Ohio 43204
Phone: 614/276-8123 Fax: 614/276-6377



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Consulting Engineers - Testing - Inspection Services - Analytical Laboratories

Established 1927

Hydraulic Conductivity - Method C - ASTM D 5084

Client: Milco Dairy	Date Tested: 9/16/2013
Project: Milco Dairy Expansion	Project #: 13050048WAP
Sample: B-17-13 15'-17'	Technician(s): MW
	Reviewed by: FS

Confining Pressure, Cp =	34 psi or 2392 cm water
Head Pressure (air), Hp =	32 psi or 2251 cm water
Back Pressure (air), Bp =	30 psi or 2110 cm water
Pipette Area, a =	0.869 cm ² (0.869(pipette), 3.476(annulus) or 4.345(both))
Pipette Length, Lp =	28.77 cm
Pipette Volume, Vp =	25 cm ³ Vo = Pipette reading out
Sample Length, L =	7.322 cm Vi = Pipette reading in
Sample Area, A =	41.931 cm ² t = Time in seconds
Temperature, T =	21.7 deg.C

$$K = (aL/2At) * \frac{\ln[(Hp - Bp + ((Vo - Vi) * Lp / Vp))]}{(Hp - Bp + ((Vo - Vi) * Lp / Vp))} \quad (t = 1)$$

$$(t = 2)$$

Permeation									
Date	Time	t (sec)	Vi*	dVi	Vo*	dVo	dVo/dVi	K	Notes
09/16/13	10:50	0	1.4	---	23.0	---	---	---	INITIAL
09/16/13	11:00	600	1.7	0.3	22.7	0.3	1.00	5.3E-07	
09/16/13	11:10	600	2.0	0.3	22.4	0.3	1.00	5.3E-07	
09/16/13	11:20	600	2.4	0.4	22.1	0.3	0.86	5.8E-07	
09/16/13	11:30	600	2.7	0.4	21.8	0.3	0.86	5.8E-07	
09/16/13	11:40	600	3.1	0.4	21.5	0.3	0.86	5.8E-07	FINAL

* Inner Pipette

Specimen Information:

Type of Permeant: Distilled Water

Average of four consecutive readings: 5.7E-07 cm/sec

Corrected permeability (K₂₀): 5.5E-07 cm/sec

Weight (lbs): 1.512
Height (in): 2.883
Diameter (in): 2.877
Height-to-Diameter Ratio: 1.002
Specific Gravity (assumed): 2.7
β:

Initial Moisture Content (%): 18.03
Initial Dry Unit Weight (pcf): 118.10
Initial Volume (ft³): 0.01
Initial Saturation (%): 113.93
Final Moisture Content (%): 16.82
Final Dry Unit Weight (pcf): 117.00
Final Volume (ft³): 0.01
Final Saturation (%): 103.07

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APPENDIX C

BORING LOCATION PLAN / SOIL PROFILE SHEETS

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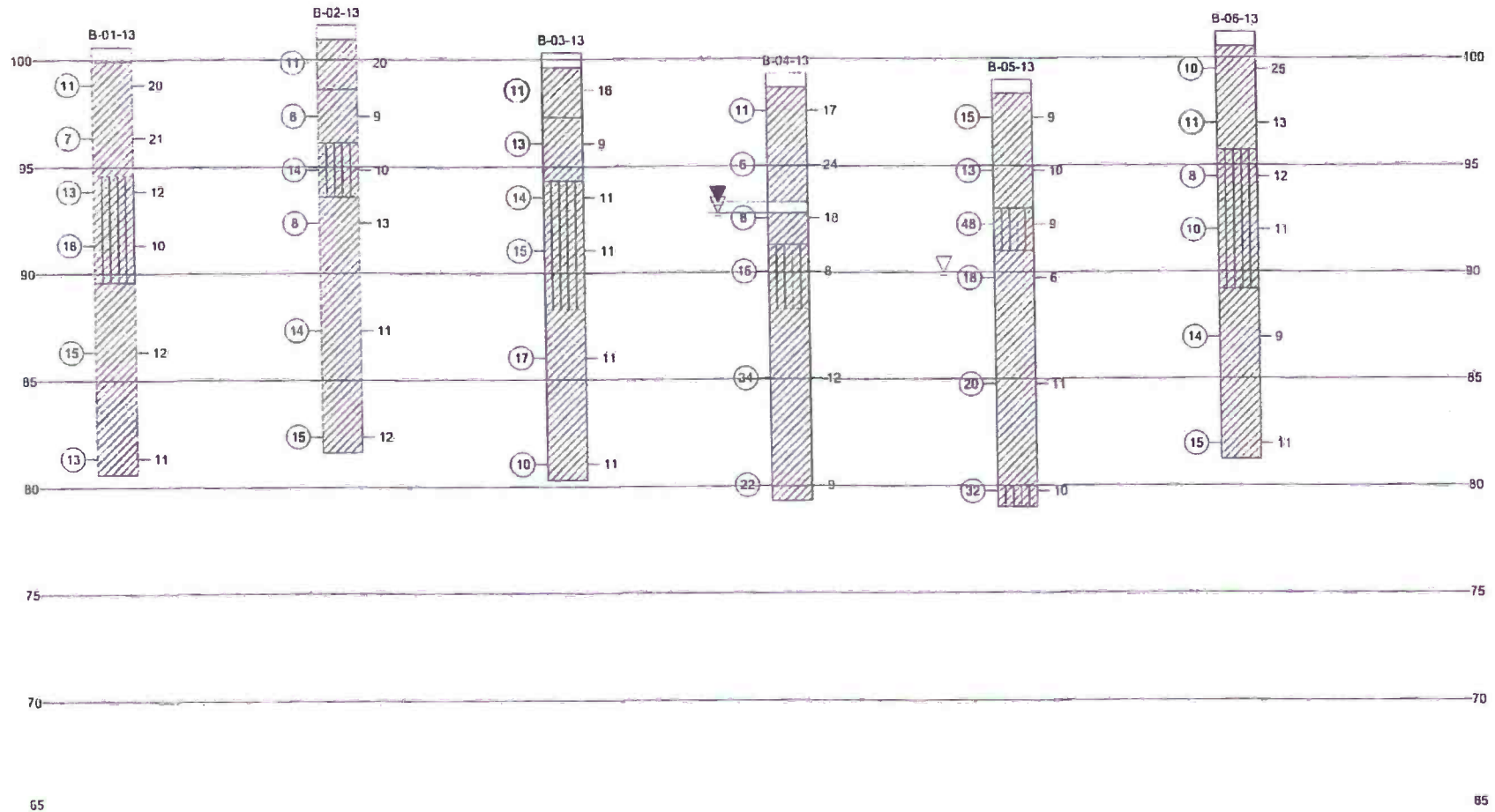
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Freestall Barn



TOPSOIL	GP-GM	SP	SC	CH	LIMESTONE
ASPHALT	GP-GC	SW-SM	SC-SM	MH	FILL
GW	GM	SW-SC	ML	OH	
GP	GC	SP-SM	CL	PT	
GW-GM	GC-GM	SP-SC	CL-M	SHALE	
GW-GC	SW	SM	OL	SILTSTONE	

LEGEND

- GROUND WATER DURING DRILLING
- GROUND WATER AT COMPLETION OF DRILLING
- GROUND WATER AT "N" HOURS AFTER COMPLETION
- MOISTURE CONTENT IN PERCENT (M)
- CORRECTED STANDARD PENETRATION IN BLOWS PER FOOT (N60)



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SOIL PLAN/PROFILE

DATE
9/25/2013
SCALE
AS SHOWN

Milco Dairy
County Road E, 1200 N. Facility
Lewisville, IN - Rush County

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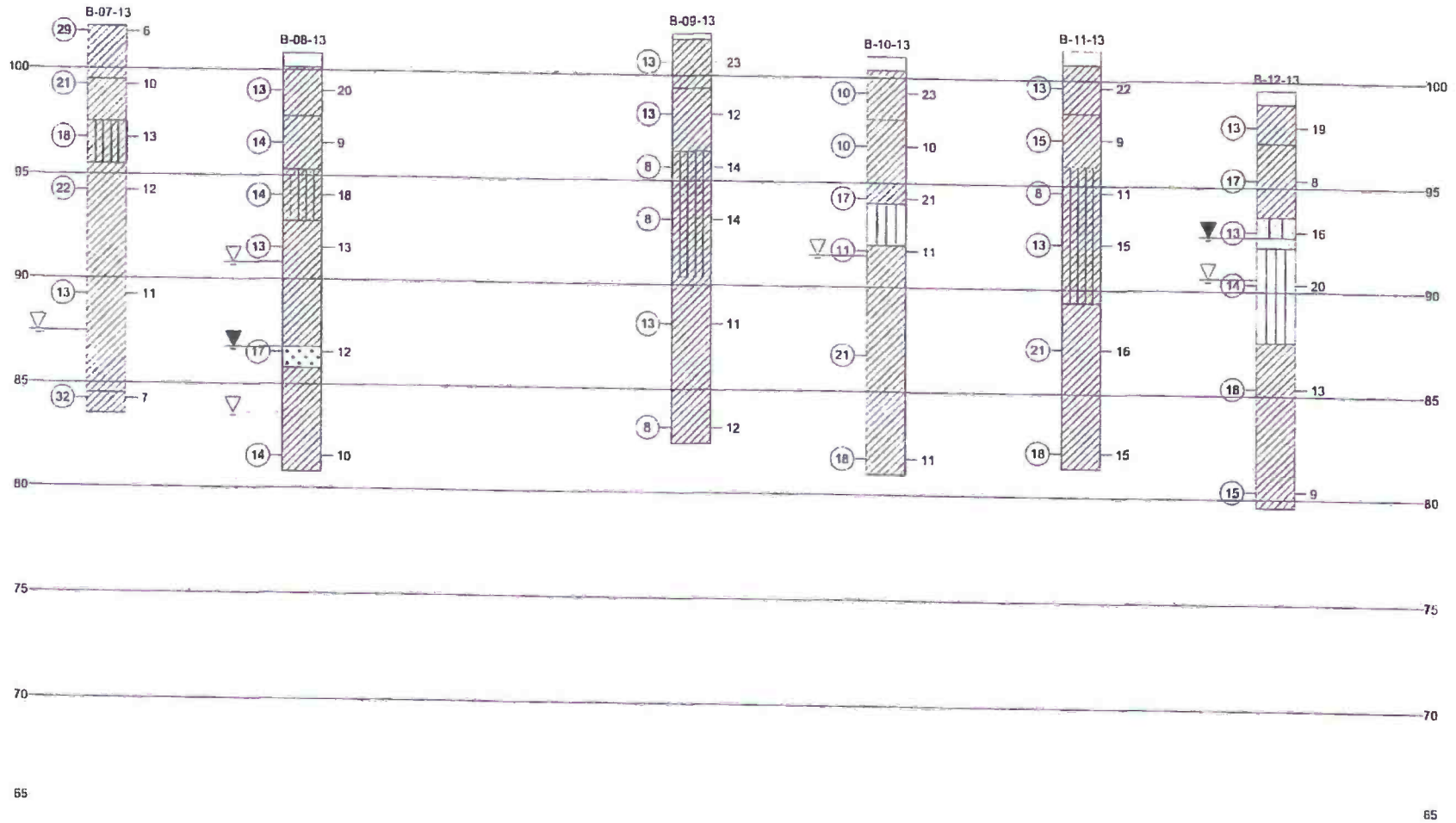
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Parlor

Bunker



TOPSOIL	GP-GM	SP	SC	CH	LIMESTONE
ASPHALT	GP-GC	SW-SM	SC-SM	MH	FILL
GW	GM	SW-SC	ML	OH	
GP	GC	SP-SM	CL	PT	
GW-GM	GC-GM	SP-SC	CL-ML	SHALE	
GW-GC	SW	SM	OL	SILTSTONE	

LEGEND

- GROUND WATER DURING DRILLING
- GROUND WATER AT COMPLETION OF DRILLING
- GROUND WATER AT 72 HOURS AFTER COMPLETION
- MOISTURE CONTENT IN PERCENT (M)
- CORRECTED STANDARD PENETRATION IN BLOWS PER FOOT (NSF)

GTL
ENGINEERING & CONSULTING
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Email: cti@gtleng.com

SOIL PLAN/PROFILE

DATE: 9/25/2013
SCALE: AS SHOWN
DRAWN BY: [blank]
PAGE: 1 OF 1
PROJECT NUMBER: 048WAP
Milco Dairy
County Road E. 1200 N. Facility
Lewisville, IN - Rush County

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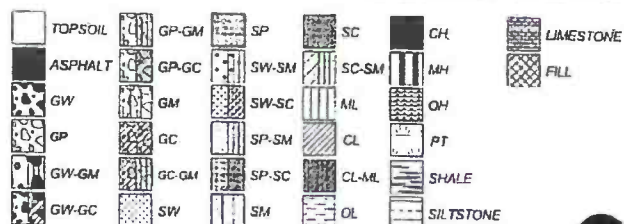
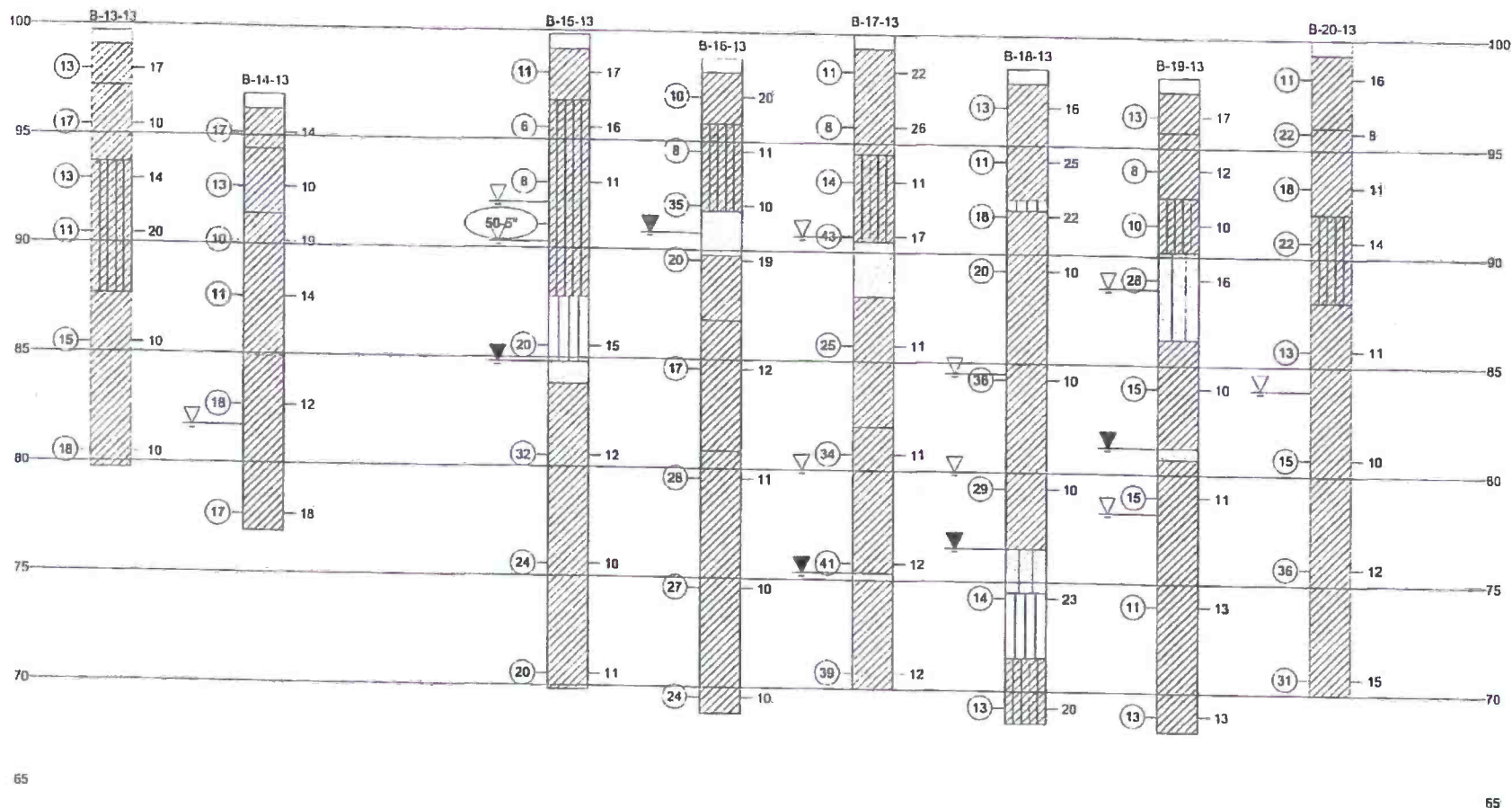
Subsurface Information

Page 73

County Line Dairy

Run-Off Lagoon

Manure Lagoon



LEGEND



GROUND WATER DURING DRILLING



GROUND WATER AT
COMPLETION OF DRILLING



GROUND WATER AT "N"
HOURS AFTER COMPLETION

CORRECTED STANDARD
PENETRATION IN
BLOWS PER FOOT (NGO)

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Fax: 419-738-7670
Email: clhwapak@ctteng.com

SOIL PLAN/PROFILE

Milco Dairy

County Road E. 1200 N. Facility
Lewisville, IN - Rush County

DATE
9/25/2013
SCALE
AS SHOWN

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PAGE
1 OF 1

PROJECT NUMBER 0048WAP

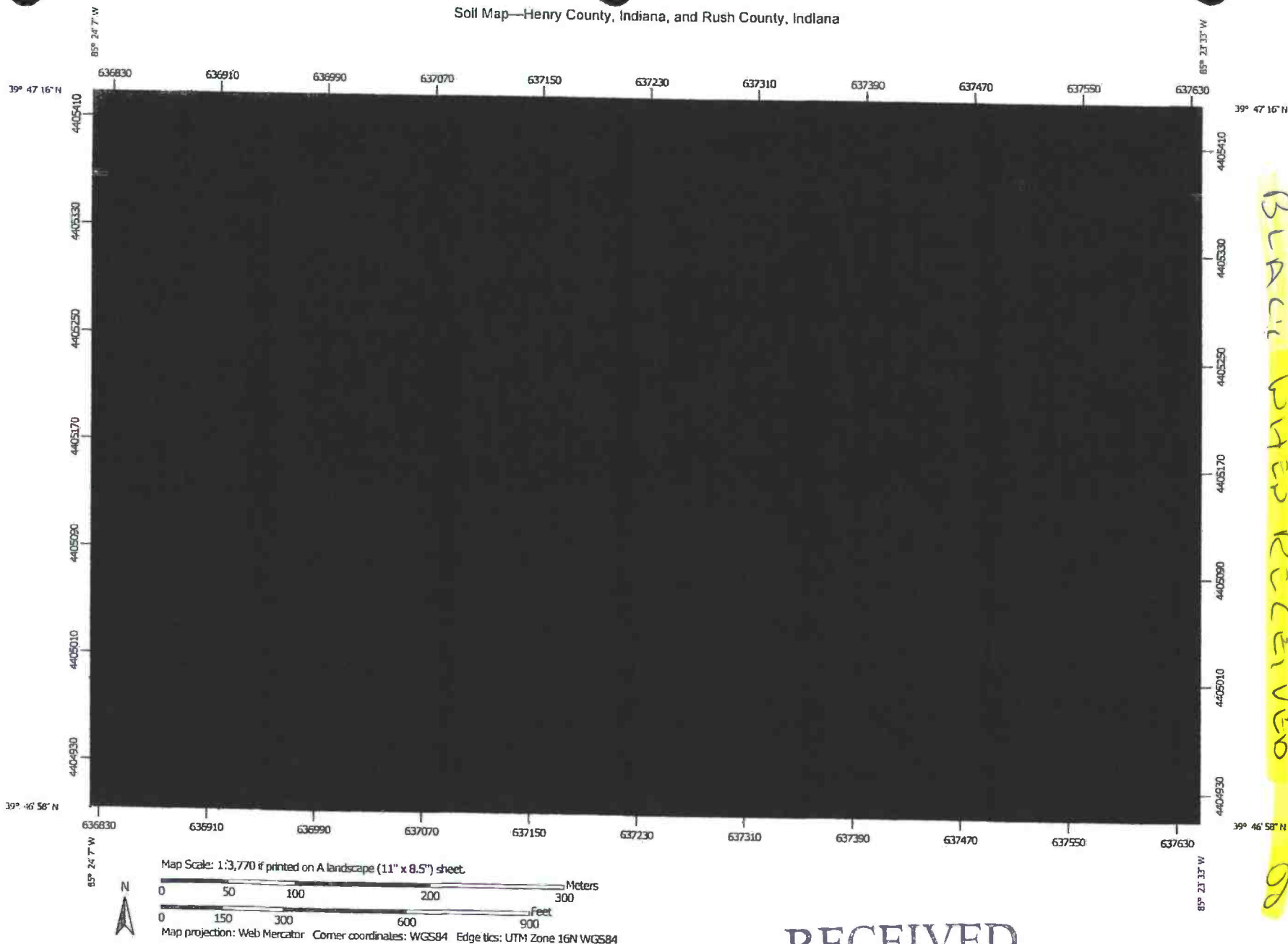
APPENDIX D

SOIL SURVEY DOCUMENTS

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Soil Map—Henry County, Indiana, and Rush County, Indiana



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National Cooperative Soil Survey

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Page 1 of 3

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Soil Map—Henry County, Indiana, and Rush County, Indiana

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websolssurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Henry County, Indiana
Survey Area Data: Version 14, Dec 10, 2011

Soil Survey Area: Rush County, Indiana
Survey Area Data: Version 15, Sep 25, 2012

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 2, 2011—Apr 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Page 2 of 3

Map Unit Legend

Henry County, Indiana (IN065)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeB2	Celina silt loam, 1 to 6 percent slopes, eroded	0.7	1.4%
CrA	Crosby silt loam, 0 to 3 percent slopes	0.5	1.1%
Cy	Cyclone silty clay loam	0.6	1.2%
Subtotals for Soil Survey Area		1.8	3.6%
Totals for Area of Interest		50.1	100.0%

Rush County, Indiana (IN139)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded	1.7	3.3%
CrA	Crosby silt loam, 0 to 3 percent slopes	22.8	45.6%
Cy	Cyclone silty clay loam	7.2	14.5%
MpB2	Miamian silt loam, 2 to 6 percent slopes, eroded	6.4	12.7%
Tr	Treaty silty clay loam	10.1	20.2%
Subtotals for Soil Survey Area		48.2	96.4%
Totals for Area of Interest		50.1	100.0%

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Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

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References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

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Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash.

Engineering Properties—Henry County, Indiana												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CeB2—Celina silt loam, 1 to 6 percent slopes, eroded												
Celina	0-9	*Silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-95	70-85	22-36	4-12
	9-32	*Clay loam, Silty clay loam, clay	CH, CL	A-6, A-7	0	0-1	98-100	90-100	85-95	65-85	35-55	15-35
	32-60	*Loam, Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0-1	0-3	85-98	75-90	65-80	40-60	15-35	4-15
CrA—Crosby silt loam, 0 to 3 percent slopes												
Crosby	0-11	*Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	90-95	70-85	25-36	5-12
	11-28	*Clay loam, Silty clay loam, clay	CH, CL	A-6, A-7	0	0-3	98-100	90-100	85-95	65-85	35-55	15-35
	28-60	*Loam, Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0-1	0-3	85-98	75-90	65-80	40-60	15-35	4-15



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Engineering Properties—Henry County, Indiana

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
Cy—Cyclone silty clay loam												
Cyclone	0-12	*Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-55	10-30
	12-46	*Silty clay loam	CL	A-6, A-7	0	0	98-100	95-100	90-100	75-90	35-43	15-21
	46-60	*Loam, Clay loam	CL, CL-ML	A-4, A-6	0	0-1	90-100	85-98	70-90	50-65	15-30	7-15
	60-80	*Loam	CL, CL-ML	A-4, A-6	0-1	0-3	90-100	85-98	70-90	50-65	15-30	6-15

Engineering Properties—Rush County, Indiana

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
CeB2—Celina silt loam, 2 to 6 percent slopes, eroded												
Celina	0-7	*Silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	75-90	25-36	5-12
	7-32	*Clay loam, Clay, silty clay loam	CL	A-6, A-7	0	0-1	100	90-100	80-100	65-90	35-50	15-30
	32-60	*Loam	CL, CL-ML	A-4, A-6	0-1	0-3	90-98	85-95	75-85	50-70	20-35	7-15

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Engineering Properties—Rush County, Indiana												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
CrA—Crosby silt loam, 0 to 3 percent slopes												
Crosby	0-14	*Silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	75-90	25-36	5-12
	14-36	*Clay loam, Silty clay loam, clay	CL	A-6, A-7	0	0-1	90-100	90-100	80-100	65-90	35-50	15-30
	36-60	*Loam	CL, CL-ML	A-4, A-6	0-1	0-3	90-98	85-95	75-85	50-70	20-35	7-15
Cy—Cyclone silty clay loam												
Cyclone	0-10	*Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-95	35-55	10-30
	10-54	*Silty clay loam	CL	A-6, A-7	0	0	98-100	95-100	90-100	75-90	35-43	15-21
	54-68	*Loam	CL, CL-ML	A-4, A-6	0	0-1	90-100	85-98	70-90	50-65	15-30	7-15
	68-80	*Loam	CL, CL-ML	A-4, A-6	0-1	0-3	90-100	85-98	70-90	50-65	20-30	6-15
MpB2—Miamian silt loam, 2 to 6 percent slopes, eroded												
Miamian	0-9	*Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	98-100	95-100	90-98	70-90	22-40	3-15
	9-32	*Clay, Clay loam	CH, CL	A-6, A-7	0-1	0-5	98-100	90-98	80-90	55-75	35-55	15-32
	32-60	*Loam	CL, CL-ML	A-4, A-6	0-1	0-5	85-98	75-90	65-80	40-60	20-35	7-15

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Engineering Properties—Rush County, Indiana												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
Tr—Treaty silty clay loam												
Treaty	0-11	*Silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	85-95	35-50	8-30
	11-36	*Silty clay loam	CH, CL	A-6, A-7	0	0	98-100	95-100	90-100	75-90	35-55	15-35
	36-48	*Loam, Clay loam	CL, CL-ML	A-6, A-7	0	0-1	90-100	85-98	70-95	50-75	25-48	6-30
	48-60	*Loam	CL, CL-ML	A-4, A-6	0-1	0-3	90-100	85-98	70-90	50-65	15-30	4-15

Data Source Information

Soil Survey Area: Henry County, Indiana
 Survey Area Data: Version 14, Dec 10, 2011

Soil Survey Area: Rush County, Indiana
 Survey Area Data: Version 15, Sep 25, 2012

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Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (K_{sat}), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service.
National soil survey handbook, title 430-VI. (<http://soils.usda.gov>)

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Report—Physical Soil Properties

Physical Soil Properties—Henry County, Indiana														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
CeB2—Celina silt loam, 1 to 6 percent slopes, eroded														
Celina	0-9	-25-	-61-	12-14- 24	1.30-1.60	4.23-14.11	0.18-0.24	0.0-2.9	1.0-4.0	.37	.37	3	5	56
	9-32	-30-	-34-	30-36- 42	1.50-1.70	4.23-14.11	0.12-0.16	3.0-5.9	0.5-1.0	.28	.28			
	32-60	-40-	-40-	12-20- 25	1.75-2.00	0.07-1.41	0.02-0.04	0.0-2.9	0.0-0.5	.49	.49			
CrA—Crosby silt loam, 0 to 3 percent slopes														
Crosby	0-11	10-18- 37	52-64- 77	6-18- 24	1.30-1.60	4.23-14.11	0.18-0.24	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	11-28	2-21- 44	24-43- 64	27-36- 44	1.50-1.70	4.23-14.11	0.12-0.21	3.0-5.9	0.5-1.0	.37	.37			
	28-60	27-40- 70	25-42- 50	4-18- 26	1.75-2.00	0.07-1.41	0.02-0.04	0.0-2.9	0.0-0.5	.49	.49			
Cy—Cyclone silty clay loam														
Cyclone	0-12	-13-	-57-	27-30- 33	1.30-1.60	4.23-14.11	0.23-0.25	3.0-5.9	3.0-6.0	.28	.28	5	6	48
	12-46	-12-	-57-	27-31- 35	1.40-1.60	4.23-14.11	0.14-0.21	3.0-5.9	0.5-2.0	.37	.37			
	46-60	-35-	-40-	15-25- 35	1.60-1.80	4.23-14.11	0.12-0.16	0.0-2.9	0.5-2.0	.37	.37			
	60-80	-40-	-45-	12-15- 20	1.60-1.75	1.41-4.23	0.02-0.04	0.0-2.9	0.0-0.5	.49	.49			



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Physical Soil Properties—Rush County, Indiana

Map symbol and soil name	Depth In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Saturated hydraulic conductivity micro m/sec	Available water capacity In/In	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility Index
										Kw	Kf	T		
CeB2—Celina silt loam, 2 to 6 percent slopes, eroded														
Celina	0-7	-25-	-61-	12-14- 24	1.30-1.60	4.23-14.11	0.18-0.24	0.0-2.9	1.0-4.0	.37	.37	3	5	56
	7-32	-30-	-34-	30-36- 42	1.50-1.70	4.23-14.11	0.12-0.16	3.0-5.9	0.5-1.0	.28	.28			
	32-60	-40-	-40-	15-20- 25	1.75-2.00	0.07-1.41	0.02-0.04	0.0-2.9	0.0-0.5	.49	.49			
CrA—Crosby silt loam, 0 to 3 percent slopes														
Crosby	0-14	-18-	-64-	12-18- 24	1.30-1.60	4.23-14.11	0.18-0.24	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	14-36	-21-	-43-	30-36- 42	1.50-1.70	4.23-14.11	0.12-0.16	3.0-5.9	0.5-1.0	.28	.28			
	36-60	-33-	-47-	15-20- 25	1.75-2.00	0.07-1.41	0.02-0.04	0.0-2.9	0.0-0.5	.49	.49			
Cy—Cyclone silty clay loam														
Cyclone	0-10	-13-	-57-	27-30- 33	1.30-1.60	4.23-14.11	0.23-0.25	3.0-5.9	3.0-6.0	.28	.28	5	6	48
	10-54	-12-	-57-	27-31- 35	1.40-1.60	4.23-14.11	0.14-0.21	3.0-5.9	0.5-2.0	.37	.37			
	54-68	-35-	-45-	15-20- 25	1.60-1.75	1.41-4.23	0.12-0.16	0.0-2.9	0.5-2.0	.43	.43			
	68-80	-40-	-45-	12-15- 20	1.60-1.75	1.41-4.23	0.02-0.04	0.0-2.9	0.5-1.0	.43	.43			

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Physical Soil Properties—Rush County, Indiana														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility Index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/in	Pct	Pct					
MpB2— Miami silt loam, 2 to 6 percent slopes, eroded														
Miamian	0-9	-23-	-61-	14-16- 27	1.30-1.60	4.23-14.11	0.18-0.24	0.0-2.9	1.0-3.0	.37	.37	3	5	56
	9-32	-25-	-35-	30-40- 45	1.50-1.70	4.23-14.11	0.11-0.15	3.0-5.9	0.5-1.0	.24	.24			
	32-60	-34-	-44-	20-22- 24	1.75-2.00	0.07-1.41	0.02-0.04	0.0-2.9	0.5-1.0	.43	.43			
Tr—Treaty silty clay loam														
Treaty	0-11	-17-	-55-	28-28- 35	1.30-1.60	4.23-14.11	0.23-0.25	3.0-5.9	3.0-6.0	.28	.28	5	6	48
	11-36	-12-	-55-	28-33- 35	1.40-1.60	4.23-14.11	0.14-0.21	3.0-5.9	0.5-2.0	.37	.37			
	36-48	-34-	-41-	20-25- 35	1.40-1.60	4.23-14.11	0.16-0.20	3.0-5.9	0.5-2.0	.37	.37			
	48-60	-40-	-43-	14-17- 20	1.60-1.75	1.41-4.23	0.02-0.04	0.0-2.9	0.5-1.0	.43	.43			

Data Source Information

Soil Survey Area: Henry County, Indiana
Survey Area Data: Version 14, Dec 10, 2011

Soil Survey Area: Rush County, Indiana
Survey Area Data: Version 15, Sep 25, 2012

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Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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Report—Soil Features

Soil Features—Henry County, Indiana									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
CeB2—Celina silt loam, 1 to 6 percent slopes, eroded									
Celina	Densic material	20-40	—		0	—	High	High	Low
CrA—Crosby silt loam, 0 to 3 percent slopes									
Crosby	Densic material	20-40	—		0	—	High	High	Low
Cy—Cyclone silty clay loam									
Cyclone		—	—		0	—	High	High	Low

Soil Features—Rush County, Indiana									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
CeB2—Celina silt loam, 2 to 6 percent slopes, eroded									
Celina	Densic material	20-40	—		0	—	High	High	Low



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Soil Features—Rush County, Indiana									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
CrA—Crosby silt loam, 0 to 3 percent slopes									
Crosby	Densic material	20-40	—		0	—	High	High	Low
Cy—Cyclone silty clay loam									
Cyclone		—	—		0	—	High	High	Low
MpB2—Miamian silt loam, 2 to 6 percent slopes, eroded									
Miamian	Densic material	20-40	—		0	—	Moderate	High	Low
Tr—Treaty silty clay loam									
Treaty		—	—		0	—	High	High	Low

Data Source Information

Soil Survey Area: Henry County, Indiana
 Survey Area Data: Version 14, Dec 10, 2011

Soil Survey Area: Rush County, Indiana
 Survey Area Data: Version 15, Sep 25, 2012

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APPENDIX E

IDEM DESIGN AND CONSTRUCTION REQUIREMENTS

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Design and Construction Requirements

The requirements that apply to all new waste management systems are addressed in this section. Additional requirements that apply to specific types of manure storage structures or manure handling systems are discussed in specific sections for each type of system.

What are the site restrictions for new waste management systems? (See 327 IAC 19-12-2)

New waste management systems must not be constructed in the following (exceptions also noted):

1. Karst terrain (exceptions follow)
2. A floodway
3. A 100-year flood plain, unless all waste management system access is at least 2 feet above the 100-year flood plain and structurally sound without lowering flood waters or the seasonal high water table below the base of the system
4. Soils that have seasonal high water tables above the base of the system unless the water table is lowered to keep it below the bottom of the waste storage system
5. Over mines (exceptions follow)

IDEM may approve construction of a new waste management system in karst terrain or over mines based upon the following site-specific information submitted to IDEM:

1. For earthen liquid manure storage structures, information from test holes at least 5 feet below the lowest point, except in karst topography where the holes must go 10 feet deep or to the bedrock, whichever is shallower.
2. Characterization of the seasonal water table and soil; refer to site specific soil borings and NRCS soil survey information for engineering related properties.
3. Design and construction specifications that assure adequate structural integrity and environmental protection.
4. Other information that IDEM deems necessary to ensure protection of human health and the environment.

What are the setback requirements for new waste management systems? (See 327 IAC 19-12-3)

Waste management systems must be located to maintain the minimum setback distances from the following features known and identifiable at the time of application submittal, including:

1. 1,000 feet from a public water supply well or public water supply surface intake structure

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2. 300 feet (for liquid manure storage structures) or 100 feet for solid manure storage structures from surface waters of the state, drainage inlets (including water and sediment control basins), sinkholes (measured from the opening or the lowest point) and off-site water wells
3. 100 feet from on-site water wells, property lines and public roads
4. 400 feet from existing off-site residential and public buildings

What are the requirements for manure storage structure capacity?

(See 327 IAC 19-12-4)

All new manure storage structures for confined feeding operations must be designed, constructed and maintained with a combined storage capacity of at least 180 days storage for all materials entering the manure storage structure, including:

1. Manure (refer to Table 1 for average production volumes listed in the ASAE document D384.2)
2. Bedding (if applicable)
3. Net average rainfall on an uncovered storage structure and any uncovered area draining into the structures (if applicable)

In addition, for uncovered manure storage structures, a 24-inch freeboard is required to manage rainfall and run-off from a 25-year, 24-hour precipitation event. A greater amount of freeboard may be required if 24 inches is inadequate to contain the calculated amount of rainfall collect during the event. In Indiana this would range from 5.0 to 5.5 inches of rain.

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Table 1.
Manure Production Values for Calculating Storage Requirement Volumes

System	Units	Total Manure ^{1,2}	Moisture, %
Swine			
Nursery Pig	cubic ft/day	.038	90
Grow/Finish	cubic ft/day	.166	90
Farrow (S&L)	cubic ft/day	.41	90
Breed/Gestation	cubic ft/day	.18	90
Dairy			
Calf	cubic ft/day	.30	83
Heifer	cubic ft/day	.78	83
Cow (90 lb milk/day)	cubic ft/day	2.4	87
Dry cow	cubic ft/day	1.3	87
Veal calf	cubic ft/day	.12	96
Beef			
Feeder calf	cubic ft/day	.81	88
Fattening cattle	cubic ft/day	1.04	92
Mature cow	cubic ft/day	1.3	88
Poultry			
Broiler	cubic ft/day	.0035	74
Pullet	cubic ft/day	.0035	75
Layer	cubic ft/day	.0031	75
Turkey (male)	cubic ft/day	.009	74
Turkey (female)	cubic ft/day	.006	74
Duck	cubic ft/day	.0063	74
Sheep			
Ewes	cubic ft/day	.11	
Lambs	cubic ft/day	.04	
Horse	cubic ft/day	.91	85

¹Values adapted from ASAE Manure Productions and Characteristics Standard D384.2 (2005).

²Prior to any changes due to dilution water addition, drying, volatilization or other physical, chemical or biological processes.

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What requirements apply to tanks used for manure storage?

(See 327 IAC 19-12-4(j & k))

Steel underground steel storage tanks may not be used for manure storage. Plastic and fiberglass tanks and above-ground steel tanks must meet following requirements:

1. Tanks must have sufficient strength to withstand design loads.
2. All tanks must be watertight.
3. Tanks previously used to store objectionable or hazardous substances must be cleaned to remove all traces of that substance before manure is put in the tank.
4. Tanks must be designed and installed to ensure the seasonal high water table is maintained below the tank or the tank is anchored to prevent flotation during seasonal high water.
5. Aboveground tanks must have protected shut-off valves for all inlet and outlet pipes.

What requirements apply to managing seasonal high water tables around waste management systems?

(See 329 IAC 19-12-4(n, o & p))

1. Any drainage system used to lower a seasonal water table around the base of a waste management system must be equipped with an access point within 50 feet of the manure storage structure for sampling of drainage tile water.
2. The system must be designed and installed to effectively collect and drain the ground water away from the structure.
3. If necessary due to a lack of gravity flow outlet, electrical pumps with backups and alternate electrical supply.
4. Have a drainage outlet no closer than 50 feet from the storage structure, be at least 50 feet from the property line in soils with a permeability of $\frac{1}{2}$ inch per hour or less, and, be at least 20 feet from the property line if the soil permeability is greater than $\frac{1}{2}$ inch per hour.
5. Any field tiles encountered during construction must be relocated or blocked at least 50 feet from the structure under construction.

What other design and construction requirements apply?

Liquid Manure Storage (See 327 IAC 19-12-4(d))

All liquid manure storage facilities must be constructed in accordance with the NRCS Conservation Practice Code 313: Waste Storage Facility, dated September 2005.

Concrete Liquid Manure Storage (See 327 IAC 19-12-4(e))

All concrete manure storage facilities must be designed and constructed in accordance with the Midwest Plan Service publications 36: Rectangular Concrete Manure Storages, 2nd Edition, 2005, or TR-9: Circular Concrete Manure Storage Tanks, March 1998.

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Earthen Liquid Manure Storage (See 327 IAC 19-12-5)

All earthen liquid manure storage structures must be designed to not exceed a seepage rate of 1/16 cubic inches per square inch per day.

Clay liners shall be no less than 1 foot thick and meet the seepage rate, or if at least 3 feet of in situ soil beneath the structure meets the maximum seepage rate, it can be used as the liner if at least 6 inches are over excavated and re compacted to break up any macro pore structure.

Any liner besides a soil liner must be installed according to any of the applicable NRCS Conservation Practice Standard Codes:

1. 521 A: Pond Sealing or Lining, Flexible Membrane, October 2006, or
2. 521 B: Pond Sealing or Lining, Soil Dispersant, October 2006, or
3. 521 C: Pond Sealing or Lining, Bentonite Sealant, October 2006.

Earthen Manure Storage/Treatment Lagoons (See 327 IAC 19-12-4(f))

Any lagoon system designed to treat manure must be constructed according to the NRCS Conservation Practice Standard Code 359: Waste Treatment Lagoon, September 2005.

Solid Manure Storage Structures (See 327 IAC 19-12-4(g))

Structures must not be constructed in sand or gravel soils unless specially designed with an approved liner. Soil types classified Unified Soil Classifications Pt, GW, GP, GM, GC, SW, SP, SM or SC must be avoided. Any approved liner for these soil classifications must meet the earthen liner maximum allowed seepage rate of 1/16 cubic inch per square inch per day.

Run-on from precipitation events must be diverted away from solid manure storage unless the design includes a method to collect and manage the contaminated runoff.

Stockpile and staging manure

Stockpiling of solid manure at a CFO is subject to the design standards of a solid manure storage structure. Stockpiling is considered a storage method at the production area whereas staging is temporary storage at the land application site. Outside stockpiling is only permitted at CFOs with this manure management technique included in the approval.

327 IAC 19-2-43 "Staging" means the temporary placement of manure at a site other than a production area.

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Vegetative Management Systems (See 327 IAC 19-12-4(l))

Vegetative management systems must be constructed according to the NRCS Conservation Practice Standard Code 635: Vegetated Treatment Area, October 2008. These systems must be maintained to provide effective treatment of runoff.

Constructed Wetlands (See 327 IAC 19-12-4(m))

Constructed wetlands must be constructed according to the NRCS Conservation Practice Standard Code:656: Constructed Wetland.

Manure Digesters or other Energy Recovery Systems (See 327 IAC 19-13-2)

Any digester or energy recovery system at a CFO or CAFO that receives only biomass as defined in IC 13-11-2-16.6 must be approved as a waste management system in accordance with IC 13-20-10.5. At the time this guidance was being published, rules relative to the operational requirements for digesters receiving biomass and other feedstock were in development. Check with IDEM's Confined feeding Permit Section to determine if any additional rule requirements apply.

Construction Inspection Procedures (See 327 IAC 19-12-4(r))

A CFO with an approved application for construction must notify IDEM at least 2 days prior to when construction of the waste management system begins. A "Construction Notification" form will accompany the CFO approval or can be duplicated from the record book to be used for the notification process.

IDEM will conduct random inspections on approved operations during construction. These inspections verify that construction is consistent with the application that was submitted and approved by IDEM. IDEM's review during these inspections include, but are not limited to, physical building placement, concrete compressive strength, grades of reinforcement steel, wall and floor thickness and the reinforcement steel spacing in walls and floors.

Written Documentation Upon Completion of Construction
(See 327 IAC 19-12-4(d & s))

The Confined Feeding Control Law requires CFO construction projects to start within 2 years of the date of approval and be completed within 4 years of the date the approval was issued or all appeals are concluded.

Within 30 days after the completed construction of an approved waste management system, and prior to the introduction of animals, the owner/operator must

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submit a Construction Completion Affidavit form to IDEM that the waste management system has been constructed and will be operated in accordance with the individual operations approval and the CFO rule.

In addition, all liquid manure storage facilities approved after July 1, 2012 must be certified upon completion by a registered professional engineer on a form provided by IDEM. A "Construction Completion Affidavit" and PE Certification Form (if applicable) will accompany the CFO approval or can be duplicated from the IDEM CFO Record Book to be used for the notification process.

Farms approved to construct multiple confinement barns or waste storage facilities must submit multiple Construction Affidavits if only a part of the approved structures are built and the operator wants to populate the barn and/or begin storing manure.

An example would be constructing only 1 of 2 approved swine barns the first year after the approval was issued and waits to construct the second barn until the third year. The producer would send an affidavit to IDEM within 30 days of completing the swine barns and prior to populating them. If the barns were approved on, or after July 1, 2012, a PE Certification of Completion must accompany the Completion Affidavit form.

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